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# USSR Report

SCIENCE AND TECHNOLOGY POLICY

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19 April 1984

## USSR REPORT

### SCIENCE AND TECHNOLOGY POLICY

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INTRODUCTION OF SCIENTIFIC AND TECHNOLOGICAL ACHIEVEMENTS ON THE LEVEL OF  
PLANNING OF THE NATIONAL ECONOMY

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 2, Dec 83 pp 61-64

[Article\*by A. Aver'yanov, candidate of economic sciences]

[Text] An increase in effectiveness of social production implies that, along with development of new types of equipment, there will be fuller distribution of already existing scientific and technological achievements, use of which is one of the most important ways of accelerating scientific and technological progress.

The scientists of our country have enriched science with significant discoveries and inventions; new types of highly efficient machines and equipment, progressive technological processes and economical materials have been developed. The technical sophistication of a number of machines and equipment is superior to foreign analogues because of less metal content per kilowatt power, upkeep, etc.

At the same time, as shown by analysis, the national economy does not obtain the required return from all forms of new technology. This retards technical retooling, improvement of its effectiveness and growth of labor productivity in some sectors of the economy. For this reason, the combination of advantages of a socialist regime with the achievements of scientific and technological progress and its increasing pace require further improvement of the system of making practical use of scientific research findings and developments.

We shall discuss some aspects of improving the planning of introduction of achievements of scientific and technological progress. In our opinion, vertical and horizontal, passive and active methods are effective means of transmitting research and development of different sectors of industry to other. Let us analyze them using specific examples.

The transmission of scientific-technical achievements to sectors of industry, when done successively from one stage of scientific development to another (for example, from an invention, production of experimental prototypes, testing them to organization of production in series) could be called a vertical method. A typical example is the use of scientific-technical achievements in aircraft engine building and development on the basis of aircraft engines, which have completed their flight service life, of a drive for 6300-kW gas-pumping units.

\*Formulation of the problem.

As we know, the existing gas-turbine aircraft engines operate on kerosene. To switch them to natural gas it is necessary to conduct a considerable volume of scientific research and experimental design work. It is necessary to refine the combustion chamber, develop a free power turbine, fuel-regulating and automatic equipment. Such designs will make it possible to render the drive self-contained and give it considerable advantages over stationary drives of gas-pumping units that are traditionally manufactured by the power machine builders of our country. Designing the drive should be based on the principle of maximum unification with the basic aircraft engine, which would permit using up to 70% of the main units and parts from engines that have been used for their flight service life in building the drive. The knowhow gained in development and refinement of the basic aircraft engine made it possible to manufacture test specimens of aircraft drives for gas pumping units within a short time, and to spend a minimal amount of time on finalizing them and utilizing the existing rigging of the basic aircraft engine for series production of the aircraft drives. The high reliability of series-produced aircraft engines and their specifications satisfy entirely the requirements of the gas industry for their use as drives in gas pumping units. The main advantage of the aircraft drives is that it is possible to manufacture a unitized, self-contained and containerized gas-pumping machine and provide maintenance service for compressor stations of high-power gas mains. In this way, there was transmission of scientific-engineering achievements from scientific research and experimental design work to organization of series production of items and the unit.

Another example of the vertical method of transmitting scientific-technological achievements is the involvement of scientific research institutes and design offices of different sectors of industry in scientific-technical collaboration and assistance to the chief organizations in other sectors for development of highly efficient prototypes of machinery and equipment of a high quality. For example, the chief design office that developed a 6300-kW gas-pumping unit was handed the knowhow in designing products, developing the technology for producing parts and units, detecting and eliminating flaws when working on the experimental specimen of the product, organizational and technical measures to improve operating reliability and increase the resource of series-produced units, etc. Use of these scientific and technical achievements by the chief design office that developed the gas-pumping unit enabled the design offices for chemical and petroleum machine building to develop and produce, within a very short time, an experimental prototype of a 6300-kW gas-pumping unit and later a 16,000-kW one.\*

Not infrequently, scientific-technical information obtained from different sectors or industry or their organizations serves as the basis for innovations in physical production. Let us call such transmission of scientific-technical achievements the horizontal method. For many enterprises and organizations that have limited opportunity for independent scientific research and experimental design work, this method is much simpler and, for this reason, horizontal transmission and introduction of scientific and technological achievements can be extended on a broader scale. This is aided by the conferences dealing with exchange of progressive production knowhow that are regularly held by the USSR State Committee for Science and Technology, ministries and agencies involved

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\*For more details about the efficiency of gas-pumping units with aircraft drives see: PLANOVYE KHOZYAYSTVO, No 4, 1983.

in relevant exhibits at exhibitions of achievements of the national economy of the USSR and Union republics.

We could also classify as a horizontal method the adoption of scientific principles and general methodological theses for development of special-target integrated programs for improving the efficiency of production.

The passive method of transmitting scientific and technical achievements is inherent in information about technical innovations that is disseminated in the form of various publications, information bulletins and publications, and is effected through the sectorial information centers.

Finally, if the developer-ministry (enterprise, developer-design office) takes an active part, along with other agencies, in introducing scientific and technical achievements into series production, implements measures to improve operating reliability of new equipment, etc., such actions could be considered the active method. A typical example is the introduction of gas-pumping units with aircraft drive to the gas industry. Starting in 1974, the developer-design office effects technical supervision over all series-produced aviation drives, to keep track of hours worked, analyze flaws in the case of malfunctions and, together with the series-producing plants, develops and introduces measures to augment this resource.

Such measures must be viewed as an extremely important national task in the area of further improvement of the country's economy, in order to upgrade knowhow in transmitting scientific and technical achievements of different sectors of industry to other sectors, since there could be considerable results from introducing them. For this purpose, starting in 1985, it would be desirable to include in the annual and five-year state plans for economic and social development of the USSR and similar plans of Union republics and sectors of the national economy, in the section entitled "Development of Science and Technology," introduction of measures with assignments of transmission of scientific research and development.

In our opinion, the sectors interested in using the scientific and technological achievements in the state plan of economic and social development, should provide for the following:

Name of scientific-technical innovations and their main specifications (output, metal content per kilowatt power, etc.).

An address for requesting documentation, degree of readiness for introduction of scientific-technical achievements, nature of technical documentation and type of technical assistance guaranteed by the developer-organization.

Scope of introduction in the plan year and for each half-year.

Annual economic gain scaled to the unit of measurement of the scientific technical achievement or the entire volume of introduction.

Transmission of scientific-technical innovations by some sectors of industry to others can be effected as follows. The developer-enterprise sends proposals about transmission to a sectorial agency of scientific-technical information, which selects and forwards the scientific-technical achievements recommended in the draft of the state plan for economic and social development to two agencies, the main administration for the sector at the relevant ministry and Intersector Information Center. The former disseminates these innovations among enterprises in the sector through the technical administration of the ministry. The Intersector Information Center forwards the scientific-technical achievements recommended for dissemination to different sectors of the national economy that are interested in using them, to territorial and republic-level centers of scientific and technical information.

In order to make use of the scientific-technical innovations, the ministries include the items subject to introduction in the planned year in the draft of the plan for economic and social development of the sector and submit this draft to the USSR Gosplan in accordance with the Methodological Instructions of the USSR Gosplan in effect concerning preparation of the draft of an annual plan. The sectorial departments and general department of science and technology of the USSR Gosplan include in the draft of the State Plan for Economic and Social Development of the USSR (in the "Development of Science and Technology" section) the scientific and technical achievements approved for introduction.

The territorial and republic-level centers of scientific and technical information forward suggestions for introduction of innovations to the gosplans of different republics and republic ministries interested in using them. An extract from the State Plan of Economic and Social Development of the USSR approved by the USSR Council of Ministers concerning the scientific research and development to be introduced is sent to the Intersector Information Center in order to implement supervision over progress in introducing scientific and technical achievements.

It would be desirable to perform economic and planning work at an enterprise (association) pertaining to transmission of scientific and technical achievements in the following manner:

The shop and department that submitted a proposal about an innovation send it to the authorized service for scientific and technical information for the shop or department, which in turn submits the new project to the scientific and technical information service of the enterprise or association (BRIZTI [office of innovations, inventions and technical information] or ORIZTI [department of innovations, inventions and technical information]).

The latter register the scientific-technical achievement and send it for a decision to the relevant functional service of the enterprise or association (chief technologist's department, design office, chief power engineer's department, etc.). It is then forwarded to the economic planning department of the enterprise or association for estimation of its economic effectiveness.



After approval of the estimate of economic effectiveness by the chief engineer of the enterprise or association, the scientific-technical innovation is included in the draft of the plan for economic and social development of the enterprise or association, which is forwarded to the main administration for the sector of the ministry.

The BRIZTI and ORIZTI report to the sectorial information center about the scientific-technical achievements submitted to the ministry.

At the same time, it is apparently expedient to keep state books on transmission and introduction of scientific-technical achievements with the indicators of an enterprise's basic performance.

Solving problems of improved planning of introduction of scientific and technological innovations will help accelerate scientific and technological progress in the national economy.

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## UTILIZING RESEARCH PERSONNEL AT HIGHER SCHOOLS

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 10, Oct 83 pp 62-69

[Article by A. Chukhno, Corresponding Member, UkSSR Academy of Sciences, and the candidates of economic sciences V. Marushchak and A. Savel'yev: "Systemic Management of the Research Potential at Higher Schools"]

[Text] The intensive growth of scientific research at the country's higher schools has resulted in transforming most of these schools from mainly academic centers into academic-cum-research centers. For example, the faculty of the Kiev State University alone includes 20 academicians and corresponding members of the UkSSR Academy of Sciences and more than 200 science Ph. D.'s and about 1,000 candidates of sciences. Together with the professorial-lecturer staff, about 2,000 associates of the university's scientific establishments are taking part in scientific research. Research is under way in more than 30 major directions. The growth of the university's research activities is reflected in the fact that the volume of research projects completed rose from 27 million rubles during the 9th 5-Year Plan to 50 million during the 10th. Qualitative changes also took place. A marked growth occurred in the proportion of research implemented in consonance with the decisions of the government, the USSR State Committee for Science and Technology, the USSR and UkSSR academies of sciences and the USSR and UkSSR ministries of higher and secondary specialized education.

At that university the economic effects of the application of research projects over the 5-year period exceed 51 million rubles. The number of patents granted to the University's scientists has climbed from 164 during the 9th 5-year Plan to 213 during the 10th. More than 1,500 students took part in carrying out projects done under contracts./1/

Considering that science nowadays accounts for the most radical changes in equipment and technology, the participation of the teaching staff at higher schools in research work enables it to constantly update its knowledge and keep abreast of the latest advances in science and technology and hence also to continually update teaching curriculums with new findings from various branches of science. To assure a high quality of the training of students, they should be imbued with the spirit of inquiry and provided with a favorable atmosphere for a creative pursuit of their studies. This can be achieved chiefly by enlisting students in scientific research work. Thus, the promotion of research projects at higher schools is necessary not just in the interest of raising the qualifications of the teaching staff but also in the interest of constantly refining the learning process.

At present the scientific and teaching personnel at higher schools are far from completely drawn into the sphere of scientific research and the actual yield of their scientific potential does not correspond to their increased possibilities. A rational regulation of the dynamics and structure of the scientific and teaching personnel at higher schools is an inseparable part of directing the scientific resources of these schools--resources characterized by a growing proportion of highly qualified scientists. Over the 1970-1978 period the total number of scientific associates and science-teaching faculty at higher schools in this country has grown at a somewhat faster rate for the country as a whole (144.1 percent) than in this republic alone (142.1 percent). But the growth rate of the number of doctors and candidates of sciences has been outpacing the growth rate of the overall number of scientific associates at higher schools. As a result, over the same period, the proportion of scientists with scientific degrees working in higher schools has risen to 40.5 from 35.3 percent, while the corresponding increase for the republic as a whole was to 31.6 from 28.1 percent. The large proportion of persons with advanced academic degrees among higher-school personnel represents considerable human resources that can be utilized in solving principal problems of science and technology. Suffice it to mention that the higher educational institutions in the republic employ about two-thirds of all science Ph.D.'s and more than one-half of all candidates of science in the Ukraine (see Table 1). The research done by students parallel to the learning process is becoming a mandatory element of the process of scientific research. In 1978 43 student design and special- design bureaus associating 8,200 students operated in the higher schools of the UkSSR Ministry of Higher Schools alone. The volume of R&D work performed by these special design bureaus totaled 2,869,600 rubles. The savings produced by the application of these projects reached 3,426,500 rubles. Higher schools displayed more than 1,700 exhibits, awarded certificates and gold, silver and bronze medals, at expositions of achievements of the USSR and UkSSR economies.

The influence of higher schools on the growth of science and advancement of scientific and technological progress in the republic could be magnified by spurring the scientific activity of all science personnel at these schools. In this connection, it is worth noting that while the total number of science-teaching personnel at these schools increased by up to 129 percent, the number of their science personnel engaging in research increased during 1970-1975 by up to 138 percent. This increase occurred not only owing to the extensive growth in the number of science-teaching personnel but also owing to the intensive mobilization of teaching personnel for research work. In 1975 the share of higher-school science personnel participating in research work rose to 88.1 percent compared with 82.4 percent in 1970. It is to be expected that this process will continue and this indicator will rise to 90-95 percent.

Table 1. Qualifications Structure of Science Personnel at Higher Educational Institutions of the UkSSR

Indicator	1970	1975	Growth Rate 1975 vs. 1970 (%)		1978	Growth Rate 1978 vs. 1970 (%)	
Numbers of science personnel in UkSSR	-	-	132.1		100.0	142.1	
Of whom:							
Science Ph.D.'s		2.4	2.4		133.3	2.5	148.4
Candidates of sciences	25.7	27.6	142.0		29.1	161.3	
Numbers of science and science-teaching personnel at higher schools	-	-	128.9		100.0	144.1	
Of whom:							
Ph.D.'s	3.1	3.2	131.8		3.1	146.1	
Candidates of sciences	32.2	33.7	134.9		37.4	155.4	
Proportion of science Ph.D.'s and candidates of sciences at higher schools to their total in the UkSSR	57.0	54.3	-		57.8	-	
Proportion of science personnel at higher schools to their total in the UkSSR	45.4	44.2	-		54.8	-	

Source: UkSSR Central Statistical Administration [TsSU]

An important factor in the mobility and productive research of higher-school science personnel is its age structure. Studies show that for scientists the most productive age interval is the 15 years from age 26 to age 40, with the peak at age 35-39 and a secondary if smaller peak at age 45-50. This is chiefly related to the amount of time spent by scientists on research. It has been established that the average 35-40 years old science Ph.D. spends 3.5 hours daily on research; for the age interval from 44 to 48 years this amount is 3.1 hours daily; for the age interval from 49 to 53, it is 2.4 hours, and at age 60 and older it is 2.1 hours. Capacity for work also decreases with increasing age among candidates of sciences.

Note that 12.9 percent of teachers and scientists at the higher schools of the Ukraine are below 30 years of age and 20.5 percent are over 50 year old. Consequently, the age structure of science-teaching personnel at the higher

educational institutions of the UkSSR harbors a considerable potential for enhancing its research productivity.

The multidisciplinary nature of activities at higher schools, due to the presence of a large number of different departments of instruction, provides the premises for conducting in them research both into traditional scientific disciplines and into interdisciplinary subjects, which is particularly promising in view of the science and technology revolution. At the same time, the proportion of scientists with advanced degrees among department heads is still low. Thus, of the 4,427 departments of instruction in the republic's higher schools in 1970, only 25.2 were chaired by science Ph.D.'s and, although by 1978 this indicator rose to 30 percent, much still has to be done in order to reinforce the departments with science Ph.D.'s. After all, the qualifications of science department chairpersons greatly influence the topical nature and success of scientific projects. This is particularly important to the new and most promising directions of science and technology.

The higher schools of science in the Ukrainian SSR, whose number totals 147, take an active part in implementing scientific research in the republic along with other research sectors. In recent years the CPSU Central Committee and the USSR Council of Ministers issued the decrees "On the Further Development of Higher Schools and Improvements in the Quality of the Training of Experts" (1979) and "On Increasing the Effectiveness of Scientific Research at Higher Educational Institutions"--decrees which pose a new task, namely, the task of transforming higher schools into an academic-scientific complex capable of not only training qualified personnel and expediting the application of research findings to the national economy but also conducting a creative exploration of all domains of knowledge, which should enhance the role of higher schools in promoting socio-economic and scientific-technical progress.

The official figures on the volume of research conducted at the country's and the republic's higher schools are extremely impressive. The network of scientific establishments of the higher schools in the republic is steadily growing: during the 10th 5-Year Plan period the higher schools subordinated to the UkSSR Ministry of Higher Schools alone maintained 5 scientific research institutes and design bureaus as well as 68 problem-oriented and 195 branch scientific research laboratories (SRL). In the last 5 years the increase in the number of these laboratories has been particularly marked: by a factor of 1.64 for branch SRL's and by a factor of 1.28 for problem-oriented SRL's.

Analysis of the figures on the fulfillment of the thematic plan of scientific research by the higher schools of the Ukrainian SSR reveals that their scientific personnel participated in researching approximately 15,000 topics, of which 34.0 percent on the basis of contracts with enterprises, kolkhozes and other organizations. On the average each higher school conducted 103.4 research projects. For the higher schools under USSR jurisdiction in the UkSSR this indicator is 80.3 projects per school, while for the higher schools under the republic's jurisdiction it is 110 projects per school. The scale and significance of this work are eloquently demonstrated by the following statistics: higher school scientists handled two-fifths of all scientific research performed in the republic. However, as regards the volume of scientific research performed by higher schools in relation to the overall volume of research performed in this republic, the higher schools of the UkSSR rank behind the higher schools of the Tajik, Estonian, Lithuanian, Moldavian

and Georgian SSRs. The overall volume of research performed by the higher schools of the UkSSR during the 10th 5-Year Plan increased by a factor of nearly 1.6 in financial terms.

The effectiveness of the research performed by the higher schools of the UkSSR is attested by the following figures: During 1978 the higher schools of the UkSSR Ministry of Higher Schools alone, which account for 39 percent of all higher schools in this republic, applied research findings serving to produce savings of about one-third of a billion rubles. The innovative nature of the research conducted at all higher schools of the republic is confirmed by the granting of more than 3,000 patents. Just as high is the authority of higher-school research on the scale of the entire country: it accounted for 40 percent of all R&D and experimental design work performed during the 10th 5-Year Plan. The predominant type of research at higher schools is scientific (basic and applied) research. The highest proportion of this work is done in the engineering and social sciences. The average number of projects conducted per higher school was 84, which was greater by a factor of 2.4 than the number of projects handled by the average scientific research institute.

A review of the thematic plans of the higher schools of the UkSSR revealed that among the schools under USSR jurisdiction those belonging to the USSR Ministry of Higher and Secondary Specialized Education and the USSR Ministry of Health have the most extensive research plans, averaging 170 and 259 topics per school, respectively, compared with 156 topics per school at the higher schools under the jurisdiction of the UkSSR Ministry of Higher and Secondary Specialized Education. The number of research topics worked on at individual higher schools located in the UkSSR varies rather broadly, on the other hand. Among the higher schools under USSR jurisdiction, 7 schools of the USSR ministries of higher and secondary specialized education, health and railways handle nearly one-half of all research projects. It is difficult to make a corresponding distinction among higher schools under republic jurisdiction, since most of them are subordinated to a single ministry. Even so, it can be said that one-half of all higher schools belonging to the UkSSR Ministry of Higher and Secondary Specialized Education handle two-thirds of all research projects.

During the 10th 5-Year Plan one-eighth of all of the country's higher schools (881) engaging in scientific research accounted for 50 percent of all R&D and experimental design work performed. The leading higher schools in the country in terms of the number of R&D and experimental-design projects handled are: Moscow University, the Leningrad Polytechnical Institute, the Moscow Power Industry Institute, the 2nd Moscow Medical Institute and the Ural Polytechnical Institute.

A distinguishing organizational feature of higher-school research is the absence of any coordinating agency. In 1980 the 147 higher schools operating on the territory of the UkSSR were subordinated to 9 USSR and 6 republic ministries and departments. The most representative of the USSR ministries in terms of the number of higher schools under its jurisdiction is the USSR Ministry of Agriculture and among the republic ministries, the UkSSR Ministry of Higher and Secondary Specialized Education and the UkSSR Ministry of Education. Naturally, administrative compartmentalization impedes an effective coordination of scientific research at higher schools, results in some triviality of research topics and complicates the acquisition of pilot-

experimental facilities. This affects adversely the effectiveness of the R&D work done at higher schools. During the 11th 5-Year Plan it took an average of 2 Ph.D.'s and 11 candidates of sciences to perform 10 research projects at the higher schools of Kiev, or only less than half as many as were needed for this purpose at establishments of the [UkSSR] Academy [of Sciences]. The size of the average team working on a consulting contract at higher schools of the UkSSR was 5 or 6 persons half of whom were teaching personnel. At the engineering schools of Leningrad the average research topic is worked on by 2-4 members of the teaching faculty, whereas for the higher schools of the country as a whole this indicator is 5.5 persons per research project. /2/ In this connection, studies have determined the relationship between the effectiveness of R&D and experimental-design projects and the level of the qualifications of the research team. Thus, in the scientific teams where most people lack advanced academic degrees the effectiveness of research work averaged 1.7 rubles per ruble of outlays, whereas in the teams whose participants include 1 to 3 candidates of sciences and/or science Ph.D.'s the yield is 3.2 rubles per ruble of outlays and in teams with 4 to 8 candidates of sciences and science Ph.D.'s it reaches 5 rubles./3/

The establishment of an agency for coordinating research at higher schools would promote the integration of their efforts to draft needed science and technology programs assuring, as a rule, maximally valuable scientific results and high effectiveness of economic application.

Among the multitude of major and complex problems of directing research potential a major place is occupied by the intensification of the organizational forms for utilizing that potential. Thus, in consonance with the changed conditions of the functioning of science in the republic, due to the transition from the extensive to the intensive path of its development, the establishment of five scientific centers in 1971 was a timely organizational measure for promoting the effectiveness of R&D work. They were the Donetsk, Dnepropetrovsk (now Dnepr), Western, Southern and Kharkov (now North-Eastern) centers. To further develop their coordinating role and promote the concentration of efforts, it was decided to establish a sixth center--the North-Western Scientific Center of the UkSSR.

Owing to the improvements in the organizational activity of these centers, the performance of not only the establishments of the UkSSR Academy of Sciences but also of the higher schools and branch scientific research institutes belonging to these centers has markedly improved. Currently these scientific centers are inter-branch coordinating agencies that integrate the efforts of higher schools and scientific-research and design-and-planning organizations and enterprises in order to promote the implementation of national economic tasks on the basis of the application of latest achievements of science and technology. This is also fostered by the establishment of oblast science coordination councils operating under the guidance of scientific centers of the UkSSR Academy of Sciences and oblast party committees.

Table 2. Geographical Distribution of Higher Educational Institutions in the Ukrainian SSR

Territorial Higher-School Center (Oblasts)	Number of Higher Schools	Student Participation (%)
Donetsk (Voroshilovgrad, Donetsk)	10.4	12.3
Dnepropetrovsk (Dnepropetrovsk, Zaporozhye, Kirovograd)	16.5	13.3
Kharkov (Poltava, Sumy, Kharkov)	19.4	18.4
Kiev (Zhitomir, Kiev, Cherkassy, Chernigov)	18.1	20.2
Lvov (Volyn, Lvov, Rovno)	10.4	10.9
Uzhgorod (Transcarpathian, Ivano-Frankovsk)	2.8	2.8
Chernovitsy (Vinnitsa, Ternopol, Khmelnytsky, Chernovitsy)	7.6	6.6
Odessa (Nikolayev, Odessa)	12.5	11.5
Simferopol (Crimean, Kherson)	4.2	4.0
Total, UkSSR	100.0	100.0

An important part of the activity of these centers is the drafting and implementation of comprehensive plans for working with regional enterprises and organizations during the current 5-year plan period on the basis of agreements for scientific and technological cooperation. The participation of 68 establishments of the Academy, 70 higher schools and about 130 branch institutes in these agreements has been enlisted. They are doing research in behalf of 300 enterprises in the country. /4/

The establishment of associations comprising Academy institutes, higher schools, branch scientific research institutes and industrial enterprises has made possible a comprehensive approach to solving national-economic problems. In particular, 18 academic-scientific-production associations (UNPO) comprising 18 Academy and branch scientific research institutes, 11 higher educational institutions and 30 industrial enterprises are successfully operating within the Donetsk Scientific Center. /5/ The purpose of establishing the UNPO was to improve the quality of scientific research, shorten the application time of R&D work, improve ideological-educational work and train experts at higher schools for the country's economy. The agreement for establishing the UNPO provided for: participation of enterprises and research institutes in augmenting the instructional and material facilities of the higher schools, on allocating appropriate funds and equipment; joint research by scientists from higher schools, [USSR and UkSSR] Academies and branch scientific research institutes; and the establishment of interdisciplinary student brigades for helping enterprises in solving their long-range problems. All this undoubtedly promotes the integration of the efforts of scientists at higher schools and in other sectors of science and promotes the application of scientific research at higher schools to production. Thus, the comprehensive program "Kiev--Computers--Design" was implemented by a UNPO consisting of: Institute of Cybernetics imeni V. M. Glushkov, UkSSR Academy of Sciences, the Kiev ZNIIEP [expansion unknown] under the USSR Gosstroy, the Giprograd [State Institute for the Planning of Cities] under the UkSSR Gosstroy, the Kievproyekt [Kiev Design and Planning] Main Administration, the Zavod Arsenal Production Association, the Kiev Polytechnical Institute, Kiev University, and others. Their combined efforts



resulted in the development of an automated system for drafting construction blueprints, serving to reduce to one-twentieth the blueprint preparation time and reduce to one-tenth the cost of blueprints.

A major scientific problem that is becoming particularly acute at present is the geographical distribution of the country's productive forces. In this connection an important factor is a rational geographical distribution of educational institutions tailored to the development prospects of productive forces in various economic regions of the country as well as to demographical factors. Researchers believe that a possible solution of this problem could be locating the training sites of experts closer to the sites of the greatest demand for them, that is, closer to the developed and new large industrial centers. This would assure improved conditions for the training of experts with allowance for the actual development possibilities of discrete regions. In addition, higher schools can perform more effectively if provided with adequate material facilities meeting the requirements of present-day science and technology. Naturally, the establishment of such facilities requires huge outlays and hence the problem of an efficient utilization of capital investments in the development of higher schools also is linked to a rational geographical distribution of these schools. Undoubtedly the solution of the problem of the migration of young specialists due to their weak ties to the areas to which they are assigned (considering that graduates of higher schools in the European part of the USSR are assigned to jobs in Siberia, Central Asia, Kazakhstan and the Far East) also hinges to some extent on a rational geographical distribution of higher schools.

Analysis of the geographical distribution of higher schools in the Ukrainian SSR during the 10th 5-Year Plan has shown that they are fairly uniformly distributed over the nine territorial higher-school centers (TVTs) (see Table 2). The number of higher schools in each of these centers, which encompass several oblasts apiece) ranges from 11 to 28, and only two TVTs--the Uzhgorod and Simferopol ones--comprise a poorly developed network of higher schools, that is, 4 and 6 higher schools, respectively. A distinguishing feature of each TVTs is that its higher-school network is formed around a university. Universities play a special role in the formation of TVTs because, unlike the medical, teacher-training and engineering schools, they train science cadres--scientific workers, the purpose of whose activity is to further scientific progress. University education is regarded as a promising form of training cadres in the country. In 1976 12 percent of all higher-school students in the USSR attended universities which accounted for only 7.7 percent of all higher schools (for the UkSSR the corresponding figures were 12.4 and 6.3 percent). Universities play an important role in developing the science and culture of the national republics and are an important element in the structure of the higher-school network of the TVTs. The functions of universities include not only the training of highly qualified cadres but also the conduct of scientific research.

The Ukrainian SSR contains nine universities and among the republics it ranks second to the RSFSR in the number of universities. In 1976 there were 65 universities with a combined enrollment of 580,000 in the USSR. The largest universities are Moscow State University (enrollment 26,000) and Leningrad State University (enrollment 20,400). Not much smaller is the Kiev State University (enrollment 19,300). Well-developed TVTs are, as a rule, attached to major territorial scientific-technical complexes (TN TK) of the republic

such as the Kiev (28.8 percent of higher schools and 20.2 percent of enrollment), Kharkov (19.6 and 17.5 percent) and Dnepropetrovsk (14.0 and 13.5 percent) ones. It is noteworthy that the number of higher schools in each TVTs correlates fairly closely with the enrollment (see Table 2).

Analysis of the geographical distribution of higher schools in the UkSSR confirms a trend established for the country as a whole. The principal number of higher schools is concentrated in cities with a population of more than 900,000 (46.1 percent) and in those with a population of 201,000 to 500,000 (22.4 percent). In this connection, the availability of more complete statistics for the UkSSR served to determine the degree of concentration of higher schools in cities of various size by means of the higher-school concentration coefficient (arithmetical mean). Thus if we take that coefficient at 1 for cities with a population of up to 100,000, it amounts to 13.2 for cities with a population of more than 900,000. Essentially, the degree of the concentration of higher schools in the larger and largest cities exceeds its counterpart in small cities by a factor of 5-13 (see Table 3).

Let us examine the special features of the geographical distribution of the network of higher schools in the republic. Analysis reveals that the higher-school sector of science disposes of a more ramified network of establishments than do other science sectors. For example, the 82 scientific institutions of the UkSSR Academy of Sciences are located in 15 cities and settlements, of which scientific research institutions in 7 cities and 2 settlement. By contrast 146 higher schools are located in 46 populated areas, that is, their network is thrice as ramified--and so far as scientific-research establishments are concerned, six times as ramified--as the network of the Academy's institutions. In practice, in many comparatively large regions of the republic science is represented by higher-school scientists alone. This means that higher schools are the carriers of scientific and technological progress in these regions, so that they also should be assigned the leading role in the drafting of regional science and technology programs. This thesis applies not just to the Ukrainian SSR but to the country as a whole. Owing to the particular geographical distribution of higher schools, their scientists are called upon to assist in all ways in implementing the program for developing the resources of the Far East and Siberia.

Table 3. Territorial Higher-School Concentration Centers in the UkSSR

City	Higher Schools		Percentage of Scientific and Science-Teaching Personnel (%)	Of Whom	
	Number	%		Science Candidates Ph.D.'s (%)	dates of Sciences (%)
Kiev	18	12.6	19.1	27.1	21.3
Kharkov	20	14.0	16.4	12.6	14.9
Odessa	15	10.5	11.6	10.8	10.6
Dnepropetrovsk	8	5.6	9.0	9.9	9.0
Lvov	10	7.0	8.4	8.6	7.7
Donetsk	5	3.5	5.5	5.4	5.6
Total, large cities	76	53.2	70.0	74.4	69.1
Total, UkSSR	144	100.0	100.0	100.0	100.0

The marked gravitation of these higher educational institutions to large cities is a legitimate process. An examination of the geographical distribution of higher schools in the Ukrainian SSR reveals that they are located in 45 cities. But 6 of the largest cities (see Table 3) house 76 percent of the total number of higher schools and 74.4 percent of their science Ph.D.'s as well as 69.1 percent of their candidates of sciences. These 6 cities, which represent 13 percent of the total number, account for 70 percent of the entire student enrollment [at higher schools] in the republic. Being the centers of the progress of science and culture, cities afford considerable opportunities for improving the quality of the training of specialists. They contain huge library resources and a broad network of cultural and educational facilities which promotes personality development. A no less important factor is that cities are centers of [UkSSR] Academy [of Sciences] and branch scientific research as well as of advanced industrial production.

The unity of the three spheres of influence on the higher schools--science, culture, and production--so characteristic of multifunctional cities, makes it possible to attract major scientists and leading production experts for the presentation of lectures at higher schools and to utilize enterprises as experiential training sites for students. This serves to bring the level of training closer to the needs of production and hence also to shorten the period of the on-the-job adaptation of young specialists.

The effect of the large concentration of higher schools in cities is also reflected in the results of the application part of their R&D work. Figures on a comparative analysis of R&D application in large cities and in the UkSSR as a whole corroborate the vigor with which the findings of scientific research are applied at centers of higher-school science. Although these cities house slightly more than one-half of the republic's higher schools (58.2 percent), these schools account for 66.2 percent of application of the entire volume of R&D work in the UkSSR (see Table 4). And although the planned volume of that application was underfulfilled by 0.8-5.1 percent in the cities as well as in the republic as a whole, it was actually overfulfilled--in particular, by a factor of 1.31 in Kiev and 1.25 in Lvov--if allowance is made for application work not covered by the plan.

Table 4. Structure of the Planned and Actual Volume of the Application of R&D Work at Higher Schools of the UkSSR

Major Cities of the Republic	Number of Projects Subject to Application Under the Yearly Plan (%)	Physical Volume of Application Over the Year	
		Projects Whose Application is Planned (%)	Overall Volume of Application (%)
Kharkov	20.1	95.9	100.1
Kiev	13.8	99.2	131.5
Odessa	9.9	97.9	101.1
Dnepropetrovsk	9.5	96.5	120.9
Lvov	8.5	96.0	125.4
Donetsk	4.4	98.2	112.0
Total, above cities	66.2	97.2	113.8
Total, UkSSR	100.0	94.9	115.8

A study of the time frame of the R&D projects completed by higher schools reveals the following fairly typical picture: 45.6 percent of the total number of planned research projects in the republic is applied immediately after completion (in the same year; 82.7 percent is applied within a year; and the remainder is applied within 2 subsequent years. The assumption that at the higher schools in large cities of the republic a majority of R&D projects is applied immediately after their completion did not prove justified. Apparently, the speed with which R&D findings are applied depends not so much on the scale of the opportunities existing for its application as on the work to organize the application. R&D findings are applied most expeditiously in Dnepropetrovsk (59.6 percent of the entire planned volume of application) and Lvov (55.2 percent), while for the largest and industrially developed cities, Kiev and Kharkov, the corresponding figures are 34.3 and 36.3 percent. If a period of one year is taken as the basis for the pace of application, Donetsk turns out to be the definite leader in this respect: its higher schools apply 92.7 percent of the entire volume of their R&D work within a year.

Analysis of the scientific potential of the higher-school sector of science points to its considerable human resources compare with the other sectors of science, both as regards the number of scientific associates and the high proportion of scientists with advanced degrees among the faculty and staff--science Ph.D.'s and candidates of sciences. Depending on the availability of these resources, the contribution of the higher-school sector of science can be much greater, if the following conditions are met:

--improvement in the material and technical facilities of higher schools, since at present their level at the work places of higher-school scientists is markedly below the level at Academy and branch scientific research institutes;

--elimination of an excessively broad number of topics (some projects are handled by just one or two scientists each) and integration of the efforts of scientists from several different departments of instruction on the basis of major long-range consulting contracts dealing with work on important national-economic problems;

--broad utilization of the advantages of the ramified nature of the network of higher schools in the republic as compared with other sectors, for the purpose of solving regional science and technology problems by concentrating science resources both within the higher school (or its department) and among several higher schools;

--strengthening of creative collaboration between higher-school scientists and scientists from other sectors as well as with production people, with the object of a more efficient utilization of the available manpower, material and financial resources of every sector when drafting comprehensive programs and, in particular, within the framework of the tried and tested organizational form of collaboration represented by the UNPO;

--drafting measures to monitor and regulate the age structure of scientific and teaching personnel at higher schools with the object of making its labor more productive.

#### FOOTNOTES

1. See: A.A. Chukhno, "Higher-School Science: Problems and Perspectives," PRAPOR KOMUNIZMU, 18 Feb 81.
2. M. I. Moldovanov, "Organizatsiya truda nauchno-pedagogicheskikh rabotnikov vuzov" [Organization of Labor Among Scientific and Science-Teaching Personnel of Higher Schools], Kiev, Znaniye, 1981, p 19.
3. "Effektivnost' intensifikatsii proizvodstva na osnove vnedreniya dostizheniy nauki" [Effectiveness of Production Intensification Based on the Application of the Achievements of Science], Moscow, Mysl', 1973, p 43.
4. B. Paton, PRAVDA, 30 Mar 83.
5. V. T. Marushchak, "Experience Gained in Intensifying Organizational Forms of the Utilization of the Republic's Scientific and Technological Potential," "Materialy respublikanskoy nauchnoy konferentsii 'Problemy i osnovnyye napravleniya razvitiya proizvodstvennykh sil Donbassa v svete resheniy XXVI s''yezda KPSS'" [Proceedings of the Republic Scientific Conference on the Problems and Basic Directions of Development of the Productive Forces of the Donets Basin in the Light of the Decisions of the 26th CPSU Congress], Donetsk, 1981, p 71.

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## SYSTEM FOR CALCULATING RESULTS OF SCIENTIFIC AND TECHNICAL PROGRESS

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 11, 1983 pp 43-49

[Article by N. Yermoshenko, candidate of economic sciences, Donetsk: "Using Norms to Calculate the Results of Scientific and Technical Progress in Plans for the Development of Oblasts"]

[Text] At the stage of developed socialism, scientific and technical progress has become a main factor in increasing production efficiency and it has started to determine the rate of the country's economic and social development. This role of scientific and technical progress will continue to grow, in light of what was emphasized at the 26th CPSU Congress: "...the conditions under which the national economy will be developing in the 1980s make the acceleration of scientific and technical progress even more urgent." The acceleration of scientific and technical progress has become an economic necessity, without which it is impossible to switch all the sectors of the national economy onto an intensive path of development.

In the process of its development, scientific and technical progress is characterized by a complex set of social and economic results. The spectrum of the social and economic results of scientific and technical progress is extremely broad and diverse: the development of science and technology influences practically every aspect of the economy and socialist society.

According to economists' estimates, between 50 and 70 percent of the growth in the country's national income is due to achievements in scientific and technical progress. This fact is also confirmed by the results of plan fulfillment for introducing new technology and the scientific organization of labor in USSR industry over the past 10 years: 67 percent of the increase in labor productivity was obtained as a result of the factors indicated<sup>1</sup>, which form the foundation of scientific and technical progress. Scientific and technical progress also plays an important role in increasing production output. To substantiate this, we will perform a small calculation: according to the results of the 10th Five-Year Plan, 75 percent of the increase in production output was due to greater labor productivity<sup>2</sup>; thus, the rise in industrial production output that can be attributed to scientific and technical progress during the 10th Five-Year Plan was  $75 \times 67/100 = 50.3$  percent. The official statistical reporting, however, does not include in its forms for introducing new technology several directions in scientific and technical progress, therefore this indicator is actually significantly higher. This is

confirmed by the results of plan fulfillment for scientific and technical progress in industry in Donetsk Oblast between 1976-1980, where the growth in production due to scientific and technical progress was about 60 percent. Therefore, determining and calculating the economic and social results of scientific and technical progress in the development of the national economy and in increasing the efficiency of national production is an objective necessity today. At least two major problems must be solved in order to do this. In the first place, we need to learn to measure precisely the contribution made by scientific and technical progress to economic and social development. In the second place, on the basis of these measurements, we need to develop and apply fixed standards that reflect the results of scientific and technical progress in regional development plans. Resolution of this second task is the subject of the present study.

The problem of measuring the influence of scientific and technical progress on production efficiency has been studied for quite a long time. The problem has been dealt with most effectively in recent years, however, in connection with the growing role of scientific and technical progress in economic and social development.

Still, making precise measurements of the contribution of scientific and technical progress to production efficiency is a pressing problem and its urgency will grow as the effect of scientific and technical developments on the economy increases. This creates a need for proper organization of accounting and the corresponding reflection of results of scientific and technical progress in plans for economic and social development in individual regions. Evidence of this can be seen in the experience of Voroshilovgrad, Donetsk, Dnepropetrovsk, Ternopol, Kharkov, and a number of other oblasts in the UkSSR, as well as in Leningrad, Leningrad Oblast, and Sverdlovsk Oblast.

In accordance with a decree issued by the CPSU Central Committee and the USSR Council of Ministers on improving the economic management mechanism, with this aim there will be a substantial increase in the role played by various standards in planning and managing the economic and social development of associations, enterprises, sectors, and regions. The goal of "...raising to a qualitatively new level the content of planning...by introducing a system of scientifically sound norms and standards..."<sup>3</sup> also applies to developing standards for planning scientific and technical progress.

Theoretical substantiation for the role of these standards is found in a monograph<sup>4</sup> that presents a whole series of valid, long-range standards, such as economic effect, labor expenditures on creating and assimilating new technology, replacement of equipment, improving product quality, financing scientific and technical progress, providing incentives for scientific and technical development, and price formation for new technology.

Of special methodological importance is the work done by the UkSSR State Planning Committee, in conjunction with the Economics Scientific Research Institute under the UkSSR State Planning Committee, on planning increases in labor productivity<sup>5</sup> and reductions in production costs by taking measures to raise the technical level of production<sup>6</sup>. The proportional growth in these indicators is determined for various directions in the introduction of new

technology: introduction of progressive technology, mechanization and automation of production, introduction of computer technology, development of new types of industrial production, and modernization of existing equipment.

This list does not include another set of directions in scientific and technical progress; expansion, reconstruction, and technical re-equipment on a new technical base; improved product quality and modernization of products; scientific organization of labor; and improved production management, planning, and organization (with the exception of introducing computer technology). Even though these directions also apply to the acceleration of scientific and technical progress in sectors of industry, they can also be applied to the industry of a region. In connection with this, an incomplete accounting of all the directions of scientific and technical progress when planning indicators for labor productivity and reducing production costs by means of scientific and technical measures, in accordance with the methodological materials from the UkSSR State Planning Committee, leads to an understatement of the proportion of the results of scientific and technical progress and the growth of the given indicators (planned and actual). Consequently, there is an incomplete picture of the actual effect of the results of scientific and technical progress on the increase in labor productivity and on the economy resulting from lower production costs. Furthermore, these standards have not been calculated for cities and rayons subordinate to oblasts or for sectors of oblast industry.

The effect of scientific and technical progress on the development of sectors of the national economy, associations, enterprises, and separate regions is substantial and diverse. The basic results of scientific and technical progress in a region are: accelerated development of the national economy and improvements in its structure; greater production efficiency based on intensification; and a decrease in negative environmental effects and improvements in the condition of the environment. The results of scientific and technical progress in the social sphere are: improved working conditions and total employment; a reduction in manual labor; an increase in the cultural and technical level of the population; development and improvement in the social infrastructure; and rational utilization of natural resources.

However, the existing methodological instructions for working out plans for economic and social development at various levels do not call for identifying and including in the plan the economic and social effects of scientific and technical progress that have been named here; this makes it difficult to express the results of scientific and technical progress in plans for associations, enterprises, and regions. Meanwhile, the plan for scientific and technical progress becomes a truly important element of the plan for a region's economic and social development only when it reflects as fully as possible the results of accelerating scientific and technical progress. In this case, the development of such plans is based objectively on the results of scientific and technical progress.

An accounting of the results of accelerating scientific and technical development and expressing these results in the plan for a region's economic and social development requires a calculation of the results of introducing scientific and technical measures into production and a determination of the quantitative influence of these results on the basic indicators in the plan for



economic and social development. In order to perform these tasks, it is necessary to establish indicators for the effectiveness of measures stemming from scientific and technical progress; to determine the possible results of incorporating scientific and technical measures in the basic directions of scientific and technical progress; to select the most acceptable indicators in five-year plans for economic and social development, which should reflect the results of scientific and technical progress; and to calculate the quantitative effect of the results of scientific and technical progress on the chosen indicators.

The initial basis for calculating the results of scientific and technical progress is the set of specific scientific and technical measures in all the sections of the plan. The basic indicators for the effectiveness of introducing scientific and technical measures, established in the Methodology (Basic Provisions) for determining the economic effectiveness of national economic applications of new technology, inventions, and rationalizers' proposals, and in the Provisional Methodology for determining the economic effectiveness of expenditures on environmental protection measures, are: annual economic effect; over-all cost accounting effect; and recovery of expenditures.

The effect of the results of accelerating scientific and technical progress on basic indicators of a region's economic and social development is determined by calculating the proportion of growth in the given indicators that is due to the introduction of scientific and technical measures.

A list of possible fundamental results of introducing scientific and technical measures is drawn up on the basis of the nature of the measures and the extent of their influence on the activity of enterprise, associations, and the region. Taking these factors into account, the basic results that can be obtained for each subsection of the plan for scientific and technical progress are determined. A list of these results is presented in table 1.

This list is confirmed by actual data on the fulfillment of the plan for scientific and technical progress in Donetsk Oblast during the 10th Five-Year Plan. All the directions of scientific and technical progress have several results. The greatest proportion of the results come from the direction "Introduction of progressive technology and mechanization and automation of production processes." In connection with this one should take into account the social and economic results of scientific and technical progress that are presented in table 1 when planning the economic and social development of associations and enterprises; and they should be added up for the various sectors of industry in the oblast, for the cities (and rayons), and for the oblast as a whole.

After establishing a list of possible results of implementing scientific and technical measures, one must determine their value in quantitative terms. Methods for calculating the annual economic effect, measuring the size of the net (commodity) production, the size of industrial and production labor force, labor productivity, production costs and profit, as well as savings of material resources, are described in the System (Basic Provisions) for determining the economic effect of utilizing new technology, inventions, and rationalizers'

proposals in the national economy, and in the sectorial systems and instructions that have been developed on the basis of the system.

Table 1. The Structure of the Basic Results of Scientific and Technical Progress by Direction

Direction of Scientific and Technical Progress	Basic Results of Scientific and Technical Progress			
	Growth in Commodity Production	Growth in Labor Pro- ductivity	Reduction in Produc- tion Costs	(in percent) Growth in Income from Sale of Products
Assimilation of new types of products and improving product quality	23.4	3.5	27.1	24.5
Introduction of progressive tech- nology and mechani- zation and automa- tion of production processes	65.1	53.5	63.0	58.2
Scientific organiza- tion of labor	6.5	27.8	4.0	12.4
Improved production management, planning, and organization	5.0	15.2	5.9	4.9
Total	100.0	100.0	100.0	100.0

For the section "Environmental Protection and Rational Utilization of Natural Resources," the effect from introducing environmental protection measures is determined in accordance with the Provisional Methodology for determining the economic effectiveness of expenditures on environmental protection measures.

The Directives on determining the indicator for reduction in the use of manual labor in industry when working out the 1981-1985 State Plan for economic and social development are used to calculate the indicator for the reduction in the use of manual labor that results from the acceleration of scientific and technical progress. In accordance with these directives, the reduction in the use of manual labor by association (production unit) and enterprise in plan estimates is determined by comparing the absolute total number of workers engaged in primary and ancillary manual operations in a base year and the number of workers in this category that is planned for the years of the five-year plan, taking into account the time needed to implement the scientific and technical measures outlined in the plan.

There are two ways to reflect the results of scientific and technical progress in regional plans for economic and social development. The first way is as follows. Other factors besides scientific and technical progress also influence the size of basic plan indicators, such as the structure (and volume) of production, and sectorial factors. The total effect of all factors,

including scientific and technical progress, should cause an over-all change in each of the basic indicators. Therefore, first we determine the size of the change in all the basic indicators due to each group of factors. Then the sum of the changes in the indicators due to all the factors is compared to the over-all increase in these factors in the plan year over the base year. If the sum of the changes due to all the groups is less than the over-all change in each of the basic indicators, this disparity is eliminated by selecting the most effective measures. In the opposite case, the results of scientific and technical progress are coordinated with the basic indicators of the regional plan for economic and social development with a certain reserve. This approach was first used in setting up the comprehensive plan for scientific and technical progress in industry in Donetsk Oblast for the 10th Five-Year Plan. An analysis of this plan showed, however, that this approach has a shortcoming: it does not provide a calculation of the regulated impact of results of scientific and technical progress on basic indicators of the regional plan for economic and social development. For the oblast's industry as a whole, the plan calls for scientific and technical progress to be responsible for a fairly high proportion of the rise in basic indicators. The rise in labor productivity due to scientific and technical progress in industry in Donetsk Oblast even exceeds this indicator for industry throughout the USSR, which is planned at 60 percent.

For example, the planned increase in commodity production due to scientific and technical progress in industry in 17 cities and rayons under oblast authority is higher than the average oblast indicator, and in the other 15, it is lower. In a number of towns and rayons this increase is very low--ranging between 4.5 and 14.8 percent.

Plans for economic and social development in the 10th Five-Year Plan did not take into account the effect of scientific and technical progress on increased labor productivity, even though the data were available. For the oblast's industry as a whole, the plan called for only 39.5 percent of the reduction in production costs to be provided by accelerated scientific and technical progress; while between 1974 and 1980 the savings from reduced production costs due to scientific and technical progress that was reflected in profits in Donetsk Oblast industry was between 80.2 and 92.8 percent.

An analysis of the results of scientific and technical progress calculated in the regional development plan confirms the need to switch to a different method that involves working out regional and sectorial (within the region) standards for the degree (or proportion) of the effect of scientific and technical progress on basic indicators in the plan for economic and social development. Plan and actual data on the proportional effect of scientific and technical progress on basic indicators of economic and social development in various towns, rayons and sectors of industry during the pre-plan period, or better yet, for the five-year period, can serve as the basis for their formation for a five-year period. For example, in ferrous metallurgy in Donetsk Oblast during the 10th Five-Year Plan, according to the plan for scientific and technical progress, the proportional effect of results of scientific and technical progress on increased commodity production was set at 51.7 percent, and it actually was 54.8 percent. The standard for this indicator for the 11th Five-Year Plan was set at a level between 50 and 60 percent.

An algorithm for working out a regional (or sectorial) standard for reflecting the results of scientific and technical progress in regions (at the oblast level) can be described as follows:

1. Proceeding from quotas set by the regional plan for economic and social development, one determines the absolute over-all growth in basic indicators over the five-year plan for the oblast as a whole ( $Y_{Aobl}^i$ ), for towns and regions under oblast authority, and for sectors of industry in the oblast ( $Y_{Aj}^i$ ), where  $i$  is the chosen basic indicator which must reflect the results of scientific and technical progress; and  $j$  is the town or rayon under oblast authority (or sector of industry in the oblast). Here we have  $\sum Y_{Aj}^i = Y_{Aobl}^i$ .
2. Taking into account the actual values for the growth in each of the basic indicators as a result of scientific and technical achievements in the previous five-year plan, a standard value is established for the proportional increase in the indicator due to scientific and technical progress throughout the oblast's industry as a whole-- $N_{obl}^i$  is expressed as a percentage and  $N_{Aobl}^i$  is expressed as an absolute value.
3. For each town and rayon under oblast authority (or sector of industry in the oblast), on the basis of an analysis of accounting data and the size of the oblast standard, an approximate value is established for the proportional increase in the indicator  $i$  that is due to scientific and technical progress-- $N_j^i$ . We then determine the absolute standard increases in the indicator  $i$  for all towns and rayons under oblast authority (and for sectors of oblast industry):

$$N_{Aj}^i = N_j^i \cdot Y_{Aj}^i / 100.$$

If  $\sum N_{Aj}^i > N_{Aobl}^i$ , then the standards  $N_j^i$  have been set properly. When this is not the case, iteration is performed in the selection of the standards. This type of algorithm for calculating regional and sectorial norms at the level of the oblast's industry will make it possible to reflect in the economic and social development plan the share contributed by each town or rayon under oblast authority (or sector of industry in the oblast) to the increase in the plan indicators that is due to scientific and technical progress at the norm level.

There is a certain relationship between the size of the increase in production output and the size of the increase in labor productivity due to scientific and technical progress. It is well known that an increase in production output occurs as a result of two primary factors: increased labor productivity and a rise in the number of workers. Under conditions of intensification of the economy, the first factor is the decisive one. Scientific and technical progress is the basis for both an increase in production output and in labor productivity. Therefore, by multiplying the proportional increase in production output due to productivity ( $N_{pj}^v$ ) and the increased in labor productivity due to scientific and technical progress ( $N_j^p$ ), we obtain the proportional increase in production output due to introduction of scientific and technical achievements ( $N_j^v$ ); that is,

$$N = N_{pj}^v \times N_j^p / 100 \cdot \%.$$

Three basic situations are possible when working out plans for the development of towns and rayons under oblast authority, sectors of oblast industry, and associations and enterprises, taking into account these norms. The first possibility is that in the plan the increase in indicator  $i$  due to scientific and technical progress corresponds to the norm. The second possibility is that the increase in indicator  $i$  due to scientific and technical progress is lower than the norm, and can even be lower than 0. The third possibility is that the increase in indicator  $i$  is higher than the norm, and it can even exceed 100 percent. In addition, there are two more individual cases: 1) the planned value for the increase in indicator  $i$  due to scientific and technical progress corresponds to the sectorial norm and does not correspond to the regional norm; 2) the plan value of indicator  $i$  due to scientific and technical progress corresponds to the regional norm and not to the sectorial norm.

Sectorial norms are determined individually for each sector of industry. Regional industrial norms are differentiated and established for each separate oblast, town, rayon or group of units, taking into account the sectorial structure of their industry and sectorial norms. When working out plans for the economic and social development of an association (production unit) or enterprise, both sectorial and regional norms are used simultaneously. Sectorial and territorial norms can be worked out by an oblast planning commission in conjunction with the oblast statistical administration (new technology division) and they can be confirmed by the executive committee of the oblast Council of People's Deputies. There should be preliminary coordination between sectorial norms and the republic State Planning Commission. This will make it possible to eliminate the shortcomings in planning regional development that were described above. In cases when the planned proportional increase in a particular indicator due to scientific and technical progress in the region's industry or in an individual sector turns out to be lower than the normative value, enterprises in the given sector need to re-examine the set of measures in order to choose the most effective ones, whose implementation would help increase the influence of scientific and technical progress on a particular indicator of economic and social development.

The primary type of norms being worked out should be oblast norms. At the level of towns and rayons under oblast authority and sectors of industry in the oblast, norms must be based on oblast norms, they must proceed from the oblast norms, and they must take into account the need for proportional development of the region's industry in sectorial and territorial terms.

The use of this method for calculating the results of scientific and technical progress in the plan for economic and social development will encourage enterprises to introduce more effective measures that ensure that scientific and technical progress will influence basic plan indicators at a level no lower than the normative level, which on the whole will promote accelerated development of science and technology. As we demonstrated above, here the association (production unit) or enterprise, while drafting a plan for technical development and organization of production, falls into a sort of chess fork play: on the one hand, the enterprise or association is supposed to use regional norms by virtue of its location in a given territory; on the other

hand, by belonging to a certain sector of industry, it is supposed to use sectorial norms. This makes it possible to provide the optimal variant for the value of the proportional influence of scientific and technical progress on the economic and social development of enterprises and at the same time it promotes the interests of balanced development of industry in a town (rayon) or sector.

We will examine the specific example of calculating the results of scientific and technical progress in indicators at the Donetsk Plant Building Combine in drafting the plan for the 11th Five-Year Plan. Sectorial norms for this enterprise were as follows: for production output--75-85 percent; for labor productivity--50-60 percent; for profit from production sales--70-80 percent. The regional norms were, respectively: 60-70 percent; 55-65 percent; and 55-65 percent. Consequently, the range of the proportional influence of scientific and technical progress on indicators of the combine's development were: 60-85 percent for production output; 50-65 percent for labor productivity; and 55-80 percent for profit from sales. The plan indicators for the proportional results of scientific and technical progress at the Donetsk Plant Building Combine for the 11th Five-Year Plan after calculating the norms presented above were: 64.8 percent for production output; 84.7 percent for labor productivity; and 66.7 percent for profits from sales; that is, they fall within the limits of the ranges for sectorial and regional norms.

For the first time the second type of regional and sectorial norms for the proportional effect of scientific and technical progress on basic indicators of the oblast's economic and social development were worked out in the course of preparing to draft the plan for scientific and technical progress in Donetsk Oblast industry for 1981-1985. These norms were confirmed by territorial administrative organs and were used to reflect the planned results of scientific and technical progress in the oblast's five-year plan for economic and social development. Data from the Donetsk Oblast comprehensive plan for scientific and technical progress in industry for 1976-1980 served as a basis for working out the norms. Sectorial and territorial norms were established for growth due to scientific and technical progress for the following basic indicators: the volume of commodity (net) production; profit due to sales; and labor productivity. When the plans for economic and social development of an enterprise, association, town, region, or sector were being drafted an effort was made to see that the effect of scientific and technical progress on the given indicators was not lower than the normative level.

In actuality, both the sectorial and regional norms were maintained in the drafting of the plan for scientific and technical progress in Donetsk Oblast industry for the 11th Five-Year Plan. Throughout the oblast's industry as a whole, norms for the effect of scientific and technical progress for the 11th Five-Year Plan were set at 55-60 percent of the increase in commodity production; 50-60 percent of the increase in labor productivity; and 60-65 percent of the increase in profits from sales. Table 2 presents the norms for the largest towns and leading sectors of industry in Donetsk Oblast.

Table 2

<u>Town or sector</u>	Proportional Effect In increased commodity <u>production</u>	of Scientific and Technical Progress In increased labor <u>productivity</u>	In increased profit <u>(in percent)</u>
Donetsk	60-70	55-65	55-65
Makeyevka			
Zhdanov			
Gorlovka			
Kramatorsk	50-60	45-55	
Coal industry	70-80	65-75	10-20
Ferrous metallurgy	50-60	45-55	60-70
Machine building and metalworking	50-60	45-55	55-65

With certain revisions these norms were also used in drafting the plan for scientific and technical progress in industry in Voroshilovgrad Oblast for 1981-1985; here they also demonstrated their practical importance.

Similar norms for the effect of scientific and technical progress should be worked out and confirmed not only for oblast industry, but also for other sectors of the region's economy.

In connection with what has been presented here, we believe that similar norms should be worked out for all the oblasts in the UkSSR on the basis of statistical materials from the UkSSR Central Statistical Administration on scientific and technical progress; and they should be sent to all the oblast party committees, oblast soviet executive committees, oblast planning commissions, and scientific centers of the UkSSR Academy of Sciences for approval. After they have been reviewed and confirmed, the norms can be used to develop territorial plans for scientific and technical progress. The next stage in using the norms can be organization of local accounting of the actual results of scientific and technical progress and its effect on basic indicators of the region's economic and social development.

The development and application of norms that reflect results of scientific and technical progress in basic indicators of economic and social development will make it possible to strengthen substantially the influence of local administrative organs on providing more balanced development of the economy in various oblasts.

#### FOOTNOTES

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2. "Materialy XXVI S'yezda KPSS" [Materials on the 26th CPSU Congress], Moscow, Politizdat, 1981, p 133.

3. "Sovershenstvovaniye Khozyaystvennogo Mekhanizma. Sbornik Dokumentov" [Improving the Economic Management Mechanism. Collection of Documents], Moscow, "Pravda", 1980, p 6.
4. "Planirovaniye Nauchno-Tekhnicheskogo Progressa na Osnove Normativov Dlitel'nogo Deystviya" [Planning Scientific and Technical Progress on the Basis of Long-Range Norms], Kiev, "Naukova dumka", 1981.
5. "Metodicheskiye Rekomendatsii po Planirovaniyu Rosta Proizvoditel'nosti Truda za Schet Meropriyatiy po Povysheniyu Tekhnicheskogo Urovnya Proizvodstva" [Methodological Recommendations for Planning Increases in Labor Productivity Due to a Rise in the Technical Level of Production], Kiev, UkSSR State Planning Committee, 1977.
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7. Z. P. Korovina, "Nauchno-Tekhnicheskii Progress i Planirovaniye" [Scientific and Technical Progress and Planning], Kiev, "Naukova dumka", 1978, p 35.
8. "Sovershenstvovaniye...", ibid.
9. Cf. "Metodicheskiye Rekomendatsii po Opredeleliyu Effektivnosti Meropriyatiy Territorial'nogo Plana Nauchno-Tekhnicheskogo Progressa i Yeye Otrazheniyu v Plane Ekonomicheskogo i Sotsial'nogo Razvitiya Regiona" [Methodological Recommendations for Determining the Effectiveness of Measures in a Territorial Plan for Scientific and Technical Progress and Reflecting this Effectiveness in the Regional Plan for Economic and Social Development], Donetsk, Industrial Economics Institute under the UkSSR Academy of Sciences, 1980.

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## MACHINE BUILDING SCIENTIFIC-TECHNICAL SOCIETY'S RECORD REVIEWED

Moscow MASHINOSTROITEL' in Russian No 10, Oct 83 pp 9-10

[Article by Z. V. Kulaytis, chairman of the review commission on new technology and member of the presidium of the LiSSR Governing Board of the NTO Mashprom [Scientific and Technical Society of the Machine Building Industry], and G. V. Dzis', scientific secretary of the NTO Mashprom Governing Board: "Twenty-five Years of the NTO Mashprom of Lithuania"]

[Text] It has been 25 years since the founding of the LiSSR Governing Board of the Scientific and Technical Society of the Machine Building Industry. Many changes have taken place over these years. The society has increased in its strength and scope and its activity has been stimulated. It now unites 67 primary organizations, more than 12,000 engineers, technicians and production innovators. At the same time, in the majority of NTO primary organizations, its members are scientists and technicians. There are 12 sections working under the governing board: foundry production, welding of materials and pressure shaping of metals, physical metallurgy and heat treatment, precision machine tools, technology of mechanical machining and assembly, tool production, and so forth. Their work is supervised by well-known specialists and scientists in the republic who work directly on the appropriate problems.

The republic's board attaches great importance to every possible development of the creative initiative of the scientific and engineering and technical community and production worker-innovators, and directs their attention to the fulfillment of plan targets, acceleration of the growth rate of labor productivity, increasing its efficiency and the quality of output produced, the search for reserves in economizing material and power resources, and reduction of manual labor. Successful implementation of these problems is promoted by their study in plenums and presidiums, and by conducting seminars, meetings, conferences, reviews and specialists' days.

Thus, the precision machine tools section regularly holds conferences on problems in the production and design of machine tools. The conferences' recommendations are introduced in the republic's machine tool building plants. The problems of improving the quality of castings, employment of the continuous casting method, and metal economy always are always in view of the intersectorial section of foundry production. The conference on application of the continuous casting process held by the section has aroused much interest. The

annual savings from its introduction at the Kaunas Tsentrolit Plant have totaled 1 million rubles. The intersectorial materials welding section annually organizes conferences, meetings, seminars and specialists' days on welding problems. Introduction in the republic's plants of air-sprayed [vozdushno-plazmennaya] cutting has made it possible to save 2,000 tons of calcium carbide and to reduce metal losses in cutting. The annual savings in the process have totaled 300,000 rubles.

The agricultural machine building section is working energetically, resolving problems in making equipment for fodder preparation plants.

The NTO Mashprom board is devoting a great deal of attention in the 11th Five-Year Plan to improvement of the properties of alloys and their combinations, protection of metal and metal parts from corrosion, utilization of robots in production processes, automation of mechanical machining in small-scale production based on ChPU [digital programming control], increasing the level of mechanization of welding operations and the durability of stamping equipment, and so forth. Special importance is attached to production mechanization and automation. Reviews and competitions are held for the best work in mechanization of materials handling, loading and unloading, and warehousing operations. Special plenums of the NTO Mashprom board have been devoted to the problems of reducing manual labor and the mechanization and automation of auxiliary production.

The board participates most actively in the All-Union Review of the Fulfillment of Plans for New Technology, and annually conducts republic reviews of plan fulfillment for the development of science and technology. A number of the primary organizations of NTO enterprises, as well as the republic board, have been awarded diplomas and monetary bonuses for active participation and the results achieved in republic and all-union reviews. The importance and popularity of these reviews are increased every year. At present, all primary organizations of the republic NTO are taking part in them. Quite a number of complete models of new equipment have been made: machines and units for fodder preparation plants, automatic packing machines, an automated site with digitally programmed machine tools, and so forth.

The republic board is carrying out specific work on the savings and efficient use of raw material, fuel and power, and other physical resources. Good results have been achieved by creative brigades which have taken part in republic competitions for the best suggestion to save electric and thermal power.

The republic's public review "The best achievements by ITR [engineering and technical personnel] and worker-innovators of NTO primary organizations in socialist competition for personal and collective creative plans for technical progress" has been held for 10 years. More than 10,000 ITR's and employees take part in it every year, and the savings from introduction of their suggestions total 25.5 million rubles. And 3,000 tons of metal, 16.2 million kilowatt-hours of electric power, 4,000 tons of standard fuel, and 21,000 gram-calories of thermal power have been saved.

Since 1971 competitions have been held for the best scientific research work by students in the field of machine building technology. With the aim of attracting the students of higher and secondary specialized educational institutions to scientific activity, the governing board, jointly with the LiSSR Komsomol Central Committee and the LiSSR Ministry of Higher and Secondary Specialized Education, the republic competition "The best work in machine building" has been held annually for 10 years.

The republic's young scientists also take part every year in all-union reviews for the best development in the field of science and technology. All-union prizes have been awarded to young scientists P. Varanauskas, I. Skuchas, A. Paulauskas, V. Vasauskas, T. Martsinkyavichyus, B. Spruogis, O. Turenko, and others.

It is difficult to list the Society's achievements in the most diverse directions. All this has been achieved through the daily activity of the governing board, sections, commissions, and primary organizations of the NTO, and through the active participation of the scientific and technical community. Important problems are facing the Society in the future as well, and it is within the power of the many thousands in the collective of the NTO Mashprom of Lithuania to resolve them.

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## IN ALLIANCE WITH SCIENCE

Moscow PRAVDA in Russian 9 Jan 84 p 1

[Editorial]

[Text] The 12-kilometer mark was just passed at the Kola Ultradeep Well; no one in the world has penetrated so deeply into the interior of our planet before. The Soviet Venera-15 and Venera-16 automatic stations are passing on valuable information about the mysterious Morning Star. In 1983 the production of around 3,700 kinds of machines, equipment, instruments and materials was mastered with the participation of scientists. Behind these facts lie the vast horizons of Soviet science, and the range of its exploration is steadily broadening in conformity with the course set by the 26th CPSU Congress. This exploration is aimed at solving problems connected with urgent needs for the development of national productive forces and with an intensification of public production.

Many sectors of industry now are progressing faster and more confidently along the main line of scientific-technical progress. New decisions made since the November 1982 CPSU Central Committee Plenum and important experiments for stimulating the development and adoption of tomorrow's technology provided a good impetus for this.

This work must be given even greater scope in the fourth year of the five-year plan. The speech by Comrade Yu. V. Andropov at the December 1983 CPSU Central Committee Plenum directed attention to the need for working constantly and persistently to accelerate scientific-technical progress. Documents of the CPSU Central Committee Plenum and of the 9th Session of the USSR Supreme Soviet, 10th Convocation, orient us toward a consistent implementation of a unified scientific-technical policy and toward a strengthening of intensive economic growth factors and they provide for a further development of studies along the most important lines and a deepening of the integration of science and production.

The 1984 State Plan poses complicated tasks for people of creative thought and creative labor. It includes more than 1,150 assignments for assimilating new

kinds of technology and more than 380 assignments for adopting progressive manufacturing methods and means of mechanization and automation. And with consideration of the plans of ministries and departments, it is intended to master some 3,900 kinds of machines, equipment, instruments and materials. It is planned to remove 2,200 obsolete kinds of industrial products from production. There will be 609 automated systems for controlling technological processes placed in operation. This large-scale program must provide for a drop of 3.9 billion rubles in production cost of industrial products in 1984 and the conditional freeing of approximately 700,000 persons in industry.

Soviet scientists, engineers and technicians received results of the CPSU Central Committee Plenum and USSR Supreme Soviet Session with enthusiasm and fervent approval, and they are full of resolve to fulfill the assigned tasks, seeing in this not only their own obligation, but their patriotic duty as well. The heads of science establishments and their party organizations must make better use of this labor enthusiasm and see to it that from the very first days of the new year every research and development collective and every subunit makes a good start and is attuned to a further increase in intensity in labor.

The rates of scientific-technical progress will depend largely on an ability to focus attention on the most acute issues, on the so-called weak points. Organization of the entire complex of scientific-technical projects still is far from adjusted. A marking of time is seen in a number of sectors, plans for new technology are not being implemented and the scope of these plans leaves much to be desired. The state of affairs in the national economy demands special attention by ministries, departments and the USSR Academy of Sciences toward an improvement in the technical level of production and in product quality.

Much will depend on how we mobilize the collectives of enterprises and of scientific research and development organizations and the engineering-technical and science cadres for accelerating scientific-technical progress. The country's production and scientific-technical potential must function fully and with a high return--that is what we must strive for and what we must achieve persistently.

It is a question of having research make a sharper turn toward priority problems of economic development and increasing science's contribution to resolution of the key national economic task of a fundamental increase in labor productivity. We must skillfully concentrate forces and means on retooling production, creating highly productive and resource-saving technology, and seeking progressive methods for the comprehensive use of raw and other materials and for environmental protection. The successes of scientific research organizations must be measured based on end results, on the actual effectiveness of scientific exploration and on the ability to reduce time periods for introducing the achievements of science and technology into production, and with consideration of the range of assimilation without fail. We cannot reconcile ourselves with the fact that the fruits of a very significant portion of studies completed annually find practical application only in one or

two enterprises. Many of the leading institutes surveyed by the USSR GKNT [State Committee for Science and Technology] generally have not passed on more than half of their developments to industry, and 40 percent of inventions patented abroad by these NII's [scientific research institutes] are not used within the country.

The CPSU CC and USSR Council of Ministers Decree "Measures for Accelerating Scientific-Technical Progress in the National Economy" examines a fundamental improvement of all work involved with this as a very important task of party, soviet, economic, trade union and Komsomol entities. The focus of attention must be measures assuring a further concentration of the potential of scientific research, design and technological organizations on satisfying both current and future needs of the national economy. By resolutely reinforcing all elements connected with the development and mastery of new equipment, by improving the results of research and by achieving active assistance of groups of scientists to large-scale introduction of the achievements of science and technology we must assure the mastery of output of products with indicators meeting the best contemporary models in the shortest possible time periods.

Let 1984 become a year of new and impressive successes for Soviet scientists in the matter of combining the advantages of our socialist system with achievements of the latest stage of the scientific-technical revolution.

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## A SHARP VIEW: COAUTHOR AMONG LAWYERS

Moscow IZVESTIYA in Russian 25 Jan 84 p 3

[Article by special IZVESTIYA correspondent R. Lynev]

[Text] Many official papers still are being drawn up clumsily and it is simply awkward to read them. For our part, we wish to show the experience of precise work on an outgoing document. The source of the experience is the USSR Ministry of the Petroleum Refining and Petrochemical Industry, and the situation is as follows. The sector has a leading institute: synthetic rubber monomers--NIIMSK [Synthetic Rubber Monomers Scientific Research Institute], located in Yaroslavl. One of its chief specialties is the development of catalysts and methods of obtaining them, which is the key to improving the sector's efficiency.

Then the ministry received letters to the effect that the institute, and chiefly the laboratory headed by Professor G. Kotel'nikov, had been recommending to production for a number of years developments which were not at all new or effective under the appearance of being new and effective, and that findings of other scientific collectives and production workers of many years ago could be discovered as their basis. Among the findings was one that at one time had been rejected by the leading institute as unsuitable and then after years passed it was passed off as the institute's own development and adopted as being foremost and progressive.

Instead of coordinating and directing the work of performers to achieve a common goal, the heads of the leading institute and that same Kotel'nikov used their own authority and position to suppress initiative of "competing" organizations and by hook or crook establish its own right to decide on a monopolistic basis what is good and what is bad for the sector. This monopolistic position also was reinforced by the fact that people who determined the sector's technical policy were included among the coauthors of the NIIMSK's developments. As a result the former director of the NIIMSK and later deputy minister V. Sobolev set the "sectorial record" for the number of patents. After he was relieved of this position the record shifted to the new director of the leading institute, G. Stepanov. Among other coauthors of G. Kotel'nikov was V. Kovalenko, chief of a laboratory of the Voronezh affiliate

of Giprokauchuk [State Planning and Scientific Research Institute of the Synthetic Rubber Industry], who by the way was engaged in evaluating the effectiveness of innovations applied in the sector; and A. Troitskiy, chief of the technical department of the Soyuzkauchuk VPO [All-Union Industrial Association], who handles the leading institute. The state put out more than a single thousand rubles in paying for such coauthorship. No one in the sector dared raise a voice against such powerful author associations, welded together in the manner of mutual guarantees.

But warning signals about trouble still were heard in the ministry and an authoritative commission was formed by order of the minister. It seriously and thoroughly looked into the matter and provided detailed recommendations on how to improve the work.

Commission members tried to rid themselves only of one thing: an investigation into which discoveries of coperformers workers of the leading institute had managed to "overturn," and when and how--through the court, through the Goskomizobreteniy [State Committee for Inventions and Discoveries] Control Council or simply by a volitional decision--and what sums they had received in remuneration. How could this be investigated? They were all old affairs, complicated by a mass of circumstances. And was it a point as to who ultimately was the legal author and who the actual author? The point is that in itself this method of self-assertion is alien to science.

The commission was not about to make a special record of such evaluations, but expressed them to Kotel'nikov and the others very definitely.

The institute collective knew about this and what happened was discussed behind the scenes. Everything seemingly was proceeding to a public evaluation of what had been discovered, and this was awaited not only in the institute. There was only one question: how would the ministry evaluate the commission's findings?

While this evaluation was being developed Kotel'nikov went on one prestige TDY after another... For many this became a sign that what had happened was only a dream, a chance fog.

Was that so? The ministry was silent for some weeks more and then set forth its position officially. It did this, as stated initially, with all possible culture. Judge for yourselves. Above all, we read in the paper, it (the ministry) deemed "proper (proper!--R. L.) the basic thesis that a sharp intensification of manufacturing processes had not yet been achieved and the series of catalysts developed under the direction of G. Kotel'nikov solved this problem only partially . . . inasmuch as the existing equipment and technological arrangement does not create conditions for realizing the capabilities of the catalysts developed."

If we remove the verbal obstruction, it turns out that we recognize the "basic thesis" and believe that it is not Kotel'nikov who is at fault, but technology. It is not the catalysts that are bad but conditions. In this manner.



But permit me! Where did the so unexpected "basic thesis" come from? From anxious signals to the ministry? But they condemned Kotel'nikov's "power methods" used against "competitors" and the crude violations of standards of scientific ethics by him and his "aktiv." From the commission's findings? But it too wrote down the point about responsibility as the very first and chief point. But the ministry paper does not even contain a word or concept of this, of someone's responsibility. Everything has been neatly and gently rubbed out by a skilled pen. As a result the reputation of the professor and coauthors is chemically pure.

How can that be? Who "corrected" both the commission and everyone else so politely in form but unceremoniously in essence? Who, frankly speaking, undermined the ministry and worded its position as a spineless, vague one?

I find out that the deputy minister who signed the document placed his signature there in literally the last hours before his transfer to another position, and with his thoughts apparently fixed on the other position, he didn't catch everything in the paper, which was drawn up so artfully. And if he did catch it, what accounting is demanded of the departed person?

Then just who is the "dubber" who adroitly loops between "yes" and "no"? Who is the true author and executor of the document? In any case let's have a look at the other side of the ministry paper. Written there, as now is the custom: "Executor A. P. Troitskiy."

Who is this Troitskiy? Is it the same one who handles the leading institute? The very same. One of the mighty cohort of Kotel'nikov's coauthors. Only Kotel'nikov is there in the institute and Andrian Petrovich keeps a vigil here in the ministry. He does so to see that not a word of condemnation addressed to the coauthor penetrates outside. He places all the blame on technology.

"Much work still has to be done with the technology," he sighs anxiously.

"And with people?" I reminded. "Is everything really in order here?"

"I believe moral appraisals of what happened must be done locally in the Institute. How? Haven't they really been given yet?" he says in surprise. "That's a disgrace. I'll call them!"

He is nobly angry at this moment and exudes principle. But I listen to him and think: just where's the difference between coauthorship and complicity?

And I also recalled that several years ago when abuse of "authorship" of the aforementioned former deputy minister V. Sobolev went beyond all bounds of decency the ministry also tried to go around this issue. And it would have done so had not the workers of the CPSU CC Party Control Committee delved into the matter.

The situation is simpler in our described case and it would appear that the ministry will be able to evaluate and correct it without outside help.

## ACTIVITIES OF KIRGHIZ INSTITUTE OF SCIENTIFIC AND TECHNICAL INFORMATION DESCRIBED

Frunze SOVETSKAYA KIRGIZIYA in Russian 25 Dec 83 p 3

[Article by T. Martysyuk, member of the Kirghiz Institute of Scientific and Technical Information and Propaganda: "A Compass in the Information Flow"]

[Text] An avalanche of scientific and technical information has come down upon the world. Who is capable to keep track of it, analyze and generalize it and to recommend one or another achievement for introduction?

We have such a service. This is the Kirghiz Institute of Scientific and Technical Information and Propaganda of the republic's Gosplan [Kirgiz INTI], which marked its twenty-fifth anniversary a few days ago.

The first technical information services were organized at machine-building plants, at the Frunze Cotton-Spinning Factory, and at a number of other enterprises. A unified coordination center appeared in 1958. At the present time, members of the institute collect, analyze and provide scientific and technical information for all ministries and departments, enterprises, scientific-research and planning and design organizations, individual specialists, scientists and administrative workers. The library issues two and a half million information documents a year.

The workers of the institute are not impassive in providing new information. They substantiate their proposals economically and, through the republic's Gosplan strive to introduce new equipment and technologies into production.

The introduction of advanced experience in the removal and reuse of technological materials at coal mines and nonferrous metal pits can serve as an example. Formerly, all mining timber and all metal equipment, such as rails, pipes, and ventilation equipment, were left at the mine after it was exhausted and, essentially, were wasted. Up to 65 cubic meters of timber was spent per each thousand tons of mined coal.

Specialists of the Kirgiz INTI organized an integrated brigade and made a trip to the Donbass. They familiarized themselves with the advanced experience in using the equipment of exhausted mines there, collected additional technical documentation, processed it and proposed it for introduction. This was initiated by

the oldest worker of the institute A. N. Potapov. As a result of this innovation, an economic effect of about one and a half million rubles was obtained at the mines of our republic.

At the present time, the network of information services of enterprises and organizations of the republic is developing and strengthening. However, our country does not have higher or specialized secondary educational institutions which would train personnel for scientific and technical information services. This is not a simple work. It requires much knowledge. Therefore, the Kirgiz INTI organized the training of information engineers jointly with the Republican Permanent Courses of Engineers and Technicians of the Ministry of Higher Education of the Kirghiz SSR. The courses are given by experienced specialists. Seminars and probation training are conducted constantly, and consultations are given for various problems of the organization of information work. About 2,000 people have already participated in this training.

This work is directed by the chief of the scientific methodological department of the institute, O. T. Rudnev. She has been working in the institute for about 15 years. She has learned thoroughly all the forms and methods of information work and readily transmits her experience and knowledge to others.

Informational activities are creative. It is difficult for people who are not curious and indifferent to anything new to work in this area. Some of them come and leave. However, those who remain are faithful to their profession for many years.

For example, R. Z. Valeyeva has been working here from the time of the formation of the institute. She directs the printing department of the institute. She handles thousands of informational materials published by the Kirgiz INTI.

S. M. Galimova joined the newly organized institute when she was still a young specialist. First, she worked as an engineer, then was a senior engineer, and now she is in charge of a department.

M. Ye. Rafikova has been working for more than a quarter of a century in the scientific and technical information system. A. A. Barabonova, N. S. Mashukova, A. V. Lebedeva and L.B. Stepanenkova have been working for a long time and demonstrated excellent accuracy in their work.

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## COORDINATION OF RESEARCH STRESSED

Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 83, p 15

[Article by V. Zuyev, Chairman of the Presidium of the Tomsk Branch, Siberian Department of the USSR Academy of Sciences; Academician; Chairman of the Council for Research Coordination, Tomsk Oblast Committee of the CPSU]

[Text] The Council for Research Coordination has been operating at the Tomsk Oblast Committee of the CPSU for more than ten years. It includes directors of scientific institutions of the Tomsk Branch of the Siberian Department of the USSR Academy of Sciences, Tomsk Scientific Center of the USSR Academy of Medical Sciences, vuz and industrial scientific research institutes, a number of plants, vuz vice chancellors for scientific work, and executives of the party oblast committee and oblast executive committee. The main concern of the council is the unification of efforts of large scientific teams of the oblast with production enterprises and institutions for the purpose of accelerating the scientific and technological progress at enterprises of various sectors of the national economy.

Their attention is focused on the fulfillment by scientific and production teams of ten integrated special-purpose programs prepared on the initiative of the council. The work on the realization of each of them is directed by the chairman of the appropriate section. The interrelations between the executors are, as a rule, based on an economic contract. The coordination council helps the directive party, Soviet and economic agencies in making scientifically substantiated decisions, in presenting concrete problems to scientists and production workers, and in achieving their timely solution.

For example, the special-purpose program on the automation of technological processes and scientific studies is directed by N. Yakovlev, department chief of the Institute of Atmospheric Optics, Tomsk Branch, Siberian Department of the USSR Academy of Sciences. Participating in this program are all scientific institutions of the branch, educational institutions of the oblast, and a number of Tomsk plants. An automated mechanical shop where all machines are controlled by a computer with the aid of the developed equipment has already been established at one of the plants. Occupying only 10% of the production areas, the shop produces more than one third of the machined products. In the institute of atmospheric optics an automation system for very complex experiments was developed on the basis of the same equipment and was put into operation, which significantly increased the work efficiency of the scientists and made it possible to conduct fundamentally new studies.

The successful fulfillment of the program was facilitated by quarterly workshop-seminars organized by the Institute of Atmospheric Optics. They helped in solving the problems of personnel training and in overcoming psychological barriers of new procedures. Plant managers are now interested in the introduction of automated quality control systems for series production. The first section of such a system at one of the plants reduced the receiving time of a series-produced products to one sixtieth. The components of this system are manufactured at Tomsk plants and in scientific institutions.

The council is doing much work on the problem of integrated automation of experimental plants. This involves the automation of the work of designers, developers and technologists. Our final goal is to automate fully the entire process: from the designing of a component to its manufacturing on computer-controlled machines. It is expected to eliminate design documentation papers and traditional drafting tables from the production cycle. It is planned to introduce the results of this research in the new complex of buildings of the SKB [Special Design Bureau] of Scientific Instrument-Making "Optika" which is already under construction.

Another example is the special-purpose program for powder metallurgy. It is directed by V. Panin, corresponding member of the USSR Academy of Sciences. It is conducted with the participation of many teams. Scientists have already developed the physical principles of new technologies of superstrong, cold-resistant, corrosion-resistant and high-temperature-resistant materials and coatings which showed their high effectiveness in tests. The stability of dies, press molds, teeth of boring machines, blades and spiral conveyors of various mixers is ten times higher than that of standard specimens.

The fulfillment of this program is discussed monthly at the meetings of chief engineers of industrial enterprises at the city committee of the Party. Experimental shops and sections of powder metallurgy and powder coatings have been put into operation at a number of industrial and construction enterprises. The results obtained in this program became a basis for creating a similar program at the RSFSR Minstroy [Ministry of Construction].

The first creation of the physicists, medical workers and production workers united by a program on scientific instrument-making was a small betatron, a cyclic accelerator of electrons for medical needs, whose series production has been set up in Tomsk. Series production of multipurpose meteorological laser locators developed by Institute of Atmospheric Optics and the SKB of Scientific Instrument-Making "Optika" has also been started.

Our experience shows how it is possible to overcome the departmental disunity of scientific and production teams in solving large-scale national economic problems. The council on the coordination of scientific studies of the Tomsk Oblast Committee of the CPSU, the Presidium and Party Committee of the Tomsk Branch of the Siberian Department of the USSR Academy of Sciences are trying to improve this experience and to shorten the time of the introduction of the results of scientific studies into production.

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CSO: 1814/82

BOOK ON THE STATE OF SCIENTIFIC RESEARCH REVIEWED

Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 83 p 15

[Review of book "Intensifikatsiya nauchnykh issledovaniy i razrabotok" [Intensification of Research and Development] by Ye. V. Kosov, Moscow, Ekonomika, 1983, 144 pages]

[Text] On the basis of his analysis of the characteristics of the modern scientific and technological potential and control mechanism of scientific activities, the author of the book, Ye. V. Kosov, investigates the complex of problems of the intensification of scientific and technological development. He examines in detail the extensive and intensive factors of the development of research and elaboration. He cites interesting data which reflects the modern level of the development of science and technology and proposes a system of indexes characterizing scientific and technological development. He analyzes the problems of the improvement of economic regulation in the sphere of scientific research and elaboration under the conditions of the necessity of their intensification. Special attention is given to the development of the cost accounting system in scientific organizations.

A separate section treats the special-purpose program approach in controlling scientific research and elaboration. He gives a sufficiently full description of the available experience in controlling scientific and technical programs and proposes ways of improving the control of this advanced form of the organization of scientific and technical jobs.

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## IMPROVED SCIENTIFIC, TECHNICAL TRAINING URGED

Moscow PRAVDA in Russian 6 Feb 84 p 3

[Article by Academician V. Legasov: "Knowing Where To Look"]

[Text] Owing to their perceptiveness and foresight, geniuses long remain close to and remembered by later generations. On perusing the works of D. I. Mendeleev and assessing his views and range of interests, one gets the impression that the answers he provides to many questions remain topical to this day.

Mendeleev is a shining and rare example of an individual who combines in himself a most erudite and inquiring mind with an active champion of enlightenment and an energetic practitioner-organizer. It is precisely such a combination of interests and abilities that is needed nowadays for scoring accomplishments in the domain of scientific and technical progress.

Mendeleev attached special importance to teaching students and elevating the level of the scientific training of practitioners. A large part of his creative life was associated with teaching. Even his discovery of the Periodic Table stemmed from a logic-based classification of chemical elements that he needed to use in his lectures in order to facilitate the study and understanding of the properties of these elements. Before his death, Mendeleev wrote: "As a teacher I invested enthusiasm and my soul in my work, and this has not been fruitless as demonstrated by a large number of free, independent and mature individuals. Students came to my lectures to listen not eloquence to but to thoughts."

He viewed teaching as the most important element in the development of Russia's productive forces. In his capital work "Osnovy khimii" [Principles of Chemistry] there is hardly a page that does not mention the possibility of the practical utilization of this or that compound, effect or property. A Mendeleevian attitude and approach to promoting education are, in my opinion, more than ever topical nowadays.

A paradoxical situation has arisen in the world at present. Our planet is capable of utilizing its aggregate resources of energy and raw materials to assure a decent life for a population twice or thrice as large as at present over many centuries. But even now there exist shortages of these and other resources. The rise of these shortages is largely due to attempts to resolve new problems by relying on traditional techniques of the extraction and utilization of energy and materials. But these techniques, which had been

invented at a time when consumption was on a much smaller scale, are insufficiently effective.

Consequently, the exploration and development of fundamentally new techniques are needed. Power industry, for example, will increasingly convert from the use of huge masses of organic fuel to nuclear sources. Metals whose production is constrained by their availability or by economic factors can be supplanted with polymeric, composite and ceramic materials.

The comprehensive utilization of raw materials, establishment of cost-efficient energy-technological enterprises, rational combination of rigid and flexible adjustable automated types of production, and replacement of traditional heating units with e.g. UHF plasmatrons that selectively heat only the desired components--such are the possible qualitative changes in technological processes. It is no accident that experts increasingly declare that we are entering the "technological era." But this turnabout can be accomplished only by properly trained persons who have mastered the achievements of present-day basic research and at the same time grasp the needs of industry.

A permanent relationship exists between the level of academic instruction and the organization of industrial production. But during transition periods when some directions lose in importance while new ones, such as nuclear engineering, microelectronics, computer technology and cryogenic and plasma techniques, grow strenuously, this relationship is particularly obvious.

The contribution of the universities to the country's industrialization, to the establishment of domestic aviation, nuclear and missile engineering and electronics has been tremendous. New chairs and departments along with institutes that gained worldwide fame, such as the Moscow institutes of aviation, engineering physics, physics technology, electronic machine building and electronic engineering, have been rapidly organized. At these institutions instruction is provided by experts who directly develop new branches and subsectors of industry. This simultaneity of the development of new types of production and the training of personnel for them has played a major role.

But now the situation is more complicated. This concerns not a few discrete disciplines but the need to adapt the current educational system to the training of experts in practically every discipline who would be capable of not only learning and perfecting the existing processes but also proposing and scientifically substantiating fundamentally new approaches that are indispensable to achieving the technological revolution.

Clearly, this cannot be done intuitively. Deliberate preparations are needed in the field of the natural sciences along with a profound grasp of economics, psychology and social problems. Advances in basic research and a correct evaluation of its findings are crucial to the rise of techniques needed for the solution of long-range industrial problems. Mendeleev foresaw this. He wrote: "The selection from among the rising generation for service to pure science should not intimidate those who understand the Homeland's urgent need for practical measures in the field of agriculture and all other forms of industry. Only when truths are inherently grasped in their absolute purity, can they be independently applied to life. Then there will be no blind emulation and love of knowledge, linked with striving toward progress, will be engendered."



As the changes in particular methods of production are commencing, a substantial and growing role will be played by chemical processes (in power industry and electronics, in the implementation of the Food Program). Being aware of this, our state is expanding chemical production at a rate that is greater by a factor of 1.5 than the growth rate of industry as a whole. At the same time, however, the number of chemical engineers graduated by the country's higher schools has been steadily declining.

A major role in training experts of the needed quality, creators of future materials and technologies, is played by our universities, because they provide the broadest and deepest academic education which promotes an easy adaptation to rapid changes and the perception of the conditional nature of the barriers separating various branches of industry as well as the ability to utilize the most varied methods for achieving the goals chosen. But this basic education should be complemented by fostering technical thought, the technical point of view, and the understanding of the most topical practical problems. A combination of these approaches is possible. Let me again cite Mendeleyev: "...avoid three equally pernicious extremes: the utopia of the dreamer who thinks that anything can be achieved by the soaring of his imagination, that inertia combined with jealousy which results in complacency, and conceited skepticism which deems nothing worthy of its regard."

Unfortunately, the existing curriculums at universities do not pay sufficient attention to technological education. There are no separate chairs of technology and discrete sections of courses in technology are taught differently in different cities--as a rule, stressing redundant information and description instead of stimulating interest in the exploration of alternative solutions. In my opinion, university teachers should remind themselves more often of the fundamental idea of Mendeleyev the teacher: "I tried to develop in the reader a spirit of inquiry, dissatisfied with simple description or contemplation and prompting and inculcating in him the habit of hard work--a spirit of inquiry prompting him to verify his ideas by experiment whenever possible."

One can teach what one knows himself. But this is of so little profit to the student if he is to work in domains that as yet are strange to the teacher! It is necessary to inculcate in the student the ability to select objects and methods of research and evaluate the probability of success as otherwise, for example, years may be spent on developing an excellent catalyst for a process which by then becomes obsolete. The result: wasted years and disappointment. A solid scientific foundation acquired by the student should help him avoid such pitfalls. D. I. Mendeleyev wrote: "In order to find something one has not only to look, and look attentively at that, but also know, and know a great deal at that, in order to know where to look."

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## EFFECT OF A CONCENTRATION OF FORCES: UNDER COMPREHENSIVE PROGRAMS

Moscow PRAVDA in Russian 18 Jan 84 p 2

[Article by A. Titarenko, secretary of Ukrainian Communist Party Central Committee, city of Kiev]

[Text] The scientific-technical revolution is posing increasingly large, complicated and largely new tasks for the national economy. As noted by CPSU CC General Secretary Comrade Yu. V. Andropov in a speech at the December 1983 CPSU CC Plenum, success in accomplishing these tasks depends on how we mobilize the collectives of enterprises and of scientific research and development organizations and the engineering-technical and scientific cadres for accelerating scientific-technical progress. This is a task of primary importance.

Experience has shown convincingly that only a concentration of forces and means in the determining directions and sectors permits achieving the greatest national economic effect in brief time periods. Such an approach is embodied in the national food and energy programs and in all-union programs in the most important directions of scientific and technological progress. With reliance on the accumulated experience, the Ukrainian Communist Party Central Committee, the republic government, and local party and soviet entities are performing extensive, goal-oriented work to perfect management of scientific-technical progress and for wide application of special-program methods in the national economy.

The republic's first scientific-technical programs were formulated back in the beginning of the 10th Five-Year Plan and their implementation produced rather good results on the whole, but at the same time it also identified a number of deficiencies. After analyzing the state of affairs, the Ukrainian Communist Party Central Committee deemed it necessary to take a number of steps to improve the quality level of programs for the current five-year plan. The procedure and deadlines for their development were determined and the overall number was curtailed sharply. Most important, however, it was deemed advisable to have republic, sectorial and regional programs along with unionwide programs with consideration of the importance and scope of the tasks at hand.

The goals and direction of republic programs were chosen with consideration of the place of the UkSSR's scientific-technical and production potential in the unionwide division of labor. Establishment of these programs was assigned to groups of experts which included the heads of ministries, departments, enterprises and organizations; scientists; and representatives of party and soviet entities. The groups subsequently were transformed into coordination councils and were given responsibility for managing the implementation of programs.

Six special comprehensive republic scientific-technical programs now are being carried out in the Ukraine: "Energy Complex," "Metal," "Material-Intensiveness," "Agro Complex," "Sugar" and "Labor." These programs are oriented toward the fullest use of the scientific-technical work already completed and toward broad introduction of progressive manufacturing methods, equipment, machines, mechanisms, new materials, and foremost forms of production and labor organization. There are 280 scientific research institutes, planning and design organizations, and universities and some 9,000 industrial enterprises, construction sites, kolkhozes and sovkhoses which have been involved in the fulfillment of program assignments. Such a concentration of scientific forces and of production and technical capacities allows a significant acceleration in accomplishing the most important scientific-technical tasks and the attainment of more and more substantial end results.

For example, implementation of the "Energy Complex" program already allowed a saving of 2.8 million tons of standard fuel, 4.5 billion kilowatt-hours of electrical energy and 17 million gigacalories of thermal energy. In the three years of operation of the "Metal" program there has been a significant saving on raw materials and other materials, including over 600,000 tons of rolled ferrous metals and 100,000 tons of cement.

The "Agro Complex" and "Sugar" programs are characterized by a course set for progressive manufacturing methods. The volumes of application of industrial methods for cultivating the most important agricultural crops have quadrupled in three years, allowing a drop in labor-intensiveness of production and an increase in the yield of corn, sugar beets and potatoes.

The "Labor" program holds a special place. Its targets, aimed at improving labor conditions and labor productivity, touch directly on the interests of collectives and on all sectors of the Ukraine's national economy. The program takes aim at improving the technical level of production and at the introduction of means of mechanization and automation everywhere. In industry alone 230,000 workers have been transferred to mechanized operations during this time.

Realization of program targets largely contributed to the fact that the productivity of social labor in the republic rose by more than 12 percent, which is equivalent to a saving of the labor of 2.3 million persons. The entire increase in national income--more than ten billion rubles--was obtained thanks to a growth in labor productivity.

The sectorial and regional scientific-technical and social-economic programs established in every ministry and department and in oblasts of the UkSSR are

designed to accomplish current tasks for the development of individual sectors and production units. I would like to take note of a number of their features.

The first feature is that regional programs are established under the direction of oblast party committees with the immediate participation of corresponding science centers of the UkSSR AN [Academy of Sciences]. This helped concentrate primary efforts on key problems of regional development and raise the incentives and responsibility of performers for end results. Another feature is the accumulation of the most valuable initiatives of labor collectives facilitating an acceleration of scientific-technical progress and an intensification of the economy.

The establishment, and especially the implementation, of comprehensive scientific-technical programs is a complicated and painstaking matter. The guarantee of success here lies in establishing precise control over the execution of plans. The Ukrainian CP Central Committee and Presidium of the UkSSR Council of Ministers periodically examine the progress in implementing republic programs. Effective control is the responsibility of coordination councils, which are headed by deputy chairmen of the UkSSR Council of Ministers at the republic program level, by heads of ministries and departments at the sectorial program level, and by party obkom secretaries and deputy oblispolkom chairmen at the regional program level.

Councils for assistance to scientific-technical progress under party obkoms, UkSSR AN science centers, and intersectorial scientific-technical information centers have been included in this work, which is carried on with the immediate participation of departments of the Ukrainian Communist Party Central Committee. There has been an elevation in the role of primary party organizations as well. Questions involving progress in fulfilling program targets are discussed at party committee and buro sessions and at party organization meetings. Life forces party workers to be constantly in the know concerning problems of scientific-technical progress and prompts them to seek out and grasp all the best provided by science and practice.

The efforts of party and soviet entities to accelerate scientific-technical progress and to assimilate special program methods largely led to a readjustment of the psychology of workers in various elements of the management staff and in their attitude toward this matter. Under conditions of the transition to a primarily intensive path of economic development a new type of manager is developing who in his practical work strives to make effective use of the achievements of science and technology.

In short, much has been done, but even more has to be done. Everything is not yet going smoothly in fulfilling what has been planned. Deadlines for completing a number of assignments are being disrupted, there are difficulties in managing program implementation, and departmental barriers have not been overcome completely. The coordination councils in particular lack persistence in assuring the smooth work of ministries, departments, science organizations and enterprises. At the same time, some managers still view program assignments as something not mandatory. These deficiencies must be remedied during the further development of special program methods of managing scientific-technical progress.

There are also other programs which degrade the results of special programs. For example, for now far from all assignments of union, republic and regional programs are included in the state plan, and so their financial and material-technical support is not always envisaged. Difficulties arising from this are understandable. It is desirable to accelerate the practical implementation of measures provided on this score by the CPSU CC and USSR Council of Ministers Decree on accelerating scientific-technical progress in the national economy. A more active participation of local soviet and planning entities also is needed in the development and implementation of programs and in the management of scientific-technical progress. Under the conditions of sectorial differentiation the problem of comprehensive utilization of material-raw material and labor resources can be resolved most effectively only with the active coordination of sectorial ministries, departments and regional entities.

Following the November 1982 CPSU Central Committee Plenum, the work of the republic party organization received new impetus in accelerating scientific-technical progress. The Ukrainian Communist Party Central Committee Plenum in April 1983 examined the progress in implementing special comprehensive republic programs and measures to elevate the role of UkSSR Academy of Sciences establishments and sectorial institutes in accomplishing the tasks of scientific-technical progress. During plenum preparations and in the course of fulfilling the decree it adopted, program assignments were made specific, the subject matter of studies and planning-design developments was revised and small scientific subunits were enlarged or in some instances abolished. The functions of the commission on scientific-technical progress of the UkSSR Council of Ministers Presidium were refined and steps were taken to improve the quality of plans for new technology and to increase the responsibility of managers and specialists of ministries, departments, and engineering-technical services of associations and enterprises for introducing the achievements of science and technology into production.

A council for assistance to scientific-technical progress was established under the Ukrainian Communist Party Central Committee and headed by CPSU CC Politburo Member, First Secretary of the CC CP of the Ukraine V. V. Shcherbitskiy for the purpose of strengthening party influence on implementing a unified scientific-technical policy and on improving the effectiveness of social production based on wide use of the achievements of science and technology. Similar councils under party obkoms became staffs for coordinating the work of local party, soviet and economic entities to accelerate the introduction of results of scientific-technical development and to set up a material-technical base for mechanization and automation of production. Agreements on creative cooperation of science and production collectives, reviews and exhibits of scientific-technical achievements, and establishment of academic-scientific-production associations became widespread.

Deserving special attention is the practice of cooperation by such party obkom councils with union and republic ministries and departments in resolving major issues envisaged by the program concerning the development of associations and enterprises, with a subsequent inclusion of innovations in the annual plans of corresponding sectors. Work begun in the oblasts with key enterprises at

which new and foremost things are assimilated on a priority basis is justifying itself.

The 26th party congress and subsequent CPSU Central Committee plenums advanced responsible tasks for accelerating scientific-technical progress. Party members and workers of the republic will bend every effort to accomplish them and are full of resolve to ensure an improvement in production efficiency and a further strengthening of our homeland's economic might and defensive capability.

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## GUARANTEES OF CREATIVENESS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 28 Dec 83 p 2

[Article by I. Nayashkov, chairman of USSR State Committee for Inventions and Discoveries]

[Text] The discovery registered under number 284, which SOTSIALISTICHESKAYA INDUSTRIYA is telling about today, is the sixtieth since the last elections to the USSR Supreme Soviet. In other words, Soviet science has been discovering and placing approximately 15 new phenomena at mankind's service yearly.

Many discoveries made since the last elections are playing an important role in carrying out tasks stemming from the CPSU CC and USSR Council of Ministers Decree "Measures for Acceleration of Scientific-Technical Progress in the National Economy." For example, the discovery by Academician Ye. Velikhov and his associates, registered under number 260, allowed the development of effective magnetohydrodynamic [MHD] lasers and experimental units with MHD-generators in which the conversion ratio of thermal energy to electrical energy is taken to 25 percent. These units should find broad application in atomic and thermonuclear power engineering in the near future.

"Much will depend on how we mobilize the collectives of enterprises and of scientific research and development organizations, and engineering-technical and scientific cadres for accelerating scientific-technical progress," Comrade Yu. V. Andropov emphasized in a speech at the just concluded CPSU Central Committee Plenum. This signifies a need to step up invention work. It is above all a matter of inventions whose importance to an acceleration of rates of scientific-technical progress is determined by their very nature. Concentrating in themselves everything that is essentially new in the development of science and technology, the inventions pave the way for new tools of labor and for new materials and progressive manufacturing methods which surpass the best world achievements in their indicators. The end result of inventive creativity therefore is an improvement in labor productivity, an increase in output, an improvement in product quality and a saving on raw-material and fuel-energy resources.

The country's army of inventors and innovators today numbers over 13 million, almost half of whom are workers. This is a remarkable characteristic of our

time. Only the society of developed socialism could have formed such boundless opportunities for technical creativeness of the masses. A new type of worker took shape under the conditions of socialism: one who strives in the labor process for creative activity which was made his moral standard and one of the most important forms of participation in development of the economy and in production management. This requirement has become a constitutional one in our country.

Invention work now is losing its spontaneous character and is turning into a mandatory stage in the process of planned development of new equipment and into a very important means for assuring its high technical level. It is not without reason that over 90 percent of the inventions registered in our country are developed by workers of state enterprises and organizations within the framework of their official activities.

But it is not only our creative collectives but also our individual inventors who have all opportunities guaranteed by the USSR Constitution for technical creativeness. They have developed many highly efficient technical innovations which help eliminate production bottlenecks. For example, the high-capacity track machine made by workers at the Kishinev Test Maintenance Section of the Moldavian Railroad D. Matveyenko and M. Matveyenko permits the total elimination of heavy manual labor of 100 workers in tightening and lubricating clamp and foundation bolts on a railroad track. Rigging developed by Saratov lathe operator M. Batrakhonov increases the labor productivity of metal workers many times over.

The swift development of scientific-technical progress in recent years placed innovators face to face with the need for seeking new collective forms of activity which help to increase significantly the effectiveness of their creative explorations. More than a million persons now are associated in integrated creative brigades which have many successes to their credit. Each year 200,000 innovators in public design bureaus develop some 300,000 technical innovations. Nine thousand public patent bureaus help innovators ensure that the results of their search concede nothing to the best world models. More than 58,000 VOIR [All-Union Society of Inventors and Rationalizers] consultation points provide comprehensive technical and legal assistance to inventors and innovators.

The constant attention to people of creative thought and comprehensive support to their work led to such a scope of the innovator movement where in a number of cases industry simply cannot keep up with it. For this reason the most acute problem to this date is the prompt introduction of completed developments no longer corresponds to the status of scientific-technical progress and demands improvement. Here too innovators have had their say by finding new solution forms. For example, the experience of the department for accelerated adoption of inventions patented abroad set up at the Tallinn Electronic Equipment Production Association deserves the closest study. This creative collective developed special tactics for creating and using competitive developments. As a result each new article includes one or more inventions without fail and the path from the idea to series production is covered in 1½ years.



As we see, there are successes, and no small ones, but we also are not closing our eyes to the fact that there still are many deficiencies in the organization of invention work in the country which hinder utilization of those enormous reserves which the army of Soviet innovators gives to industry. Many ministries and departments are not yet giving proper attention to these matters. As a result, a number of developer groups--NII's [scientific research institutes] and KB's [design buros]--perform patent information research to an insufficient extent and at a low professional level when developing new equipment, especially in the stage which precedes the establishment of a thematic plan and technical assignment. It is not surprising that the technical level of many developments continues to be low. Suffice it to say that some 90 percent of inventions used last year provided only 40 percent overall economic effect. At the same time, the remaining 60 percent was obtained from the use of ten percent of the inventions, each of which produced more than 100,000 rubles in savings.

We also are not closing our eyes to the fact that in the situation at hand the USSR State Committee for Inventions and Discoveries has not yet made extensive use of its opportunities to improve invention work in the country. In the decree entitled "Measures for Acceleration of Scientific-Technical Progress in the National Economy," the CPSU Central Committee and USSR Council of Ministers set for the Goskomizobreteniy [State Committee for Inventions and Discoveries] the task of making fuller use of the rights granted it for managing invention and innovation work and for improving normative documents on matters of invention and innovation. This assignment makes it mandatory for the committee to assess its work critically in light of the ever-increasing demands on the level and effectiveness of new equipment and technology in order to direct the accumulated experience in managing invention work in the country toward a further increase in the role of discoveries, inventions and innovative suggestions in the acceleration of scientific-technical progress.

We intend above all to accelerate the work of improving invention legislation by making a number of changes in the existing Statute on discoveries, inventions and innovative suggestions with consideration of the proposals of ministries, departments, enterprises, organizations and individual citizens.

The work will continue for improving and simplifying the procedure for payment of a reward for inventions used in the national economy. The plans are to establish a one-time payment of a reward to authors by those enterprises, organizations and establishments which are first to use the invention, and to apply incentives for innovators for developing highly effective technical innovations, the use of which contributes to the establishment of new directions in the development of equipment or technology which are of great national economic importance.

According to the good old tradition, the Soviet people will greet the elections to the USSR Supreme Soviet with new labor achievements. No small contribution to these successes will be made by the innovators--workers, scientists and engineers. The boldness of their concepts, the talent, purposefulness, and active position in life will help the national economy arrive at new goals, the might of our Motherland will be strengthened even more, and the welfare of Soviet citizens will be raised.

## MOLDAVIAN SCIENTIFIC-TECHNICAL COLLABORATION EXAMINED

Kishinev SOVETSKAYA MOLDAVIYA in Russian 4 Feb 84 p 3

[Interview with V. Rotaru, deputy director of the Moldavian NII [Scientific Research Institute] of Scientific and Technical Information and Technical and Economic Research, by SOVETSKAYA MOLDAVIYA correspondent; date and place not specified: "The Responsibility of a Collaborator in Execution"]

[Text] The rates of scientific and technical progress depend directly on the timely fulfillment of the All-Union special-purpose and scientific and technical programs stipulated by the five-year plan. Developed by the USSR Gosplan, the State Committee for Science and Technology, and the USSR Academy of Sciences with the participation of ministries and departments, they are already providing a large national economic gain. And this gain will undoubtedly increase if those who are collaborating in executing the special-purpose programs meet their targets on schedule and to the full extent.

V. Rotaru, deputy director of the MSSR Scientific Research Institute of Scientific and Technical Information and Technical and Economic Research, interviewed by a SOVETSKAYA MOLDAVIYA correspondent, tells how the republic's scientific and planning institutions and enterprises--those who collaborate in executing the special-purpose programs--are doing this.

[Question] "To begin with, Vasilii Stepanovich, several words about the importance and features of such programs."

[Answer] "Special-purpose and comprehensive scientific and technical programs are a tested means of resolving the most important national economic problems systematically. In the current five-year plan, 170 of them are being carried out in the country. The principal merit of such programs is the orientation toward specific ultimate goals, and the comprehensive [skvozhnoye] planning of periods and stages for conducting operations throughout the entire chain--from the scientific search to the realization of its results. Consequently, the more efficiently work by those who collaborate in their execution is organized, the more rapidly we will be able to put the achievements of science and technology at the service of production."

[Question] "What are the tasks stipulated by the special-purpose programs in which Moldavia's scientific and production potential has been involved? What are the role and function in them of the republic's scientific and planning organizations, industrial enterprises and agriculture?"

[Answer] "More than 40 of our institutes and enterprises are taking part in the development of 33 All-Union programs, including 14 special-purpose ones. In the current five-year plan, they are carrying out about 300 specific targets within the framework of one program or another. Among those collaborating in their execution are institutes of the MSSR Academy of Sciences; the Selektsiya, Dnestr, Gibrid, Progress, Volna and Moldsel'mash scientific production associations; the Foundry Machinery Plant imeni S. M. Kirov; and the Moldavizolit, Elektromashina, Signal and other plants. The programs in which they are taking part cover the most important sectors of the national economy and have been called upon to resolve crucial scientific and technical problems. These are the creation of new types of equipment, increasing the production of food products, development of new automated control systems, utilization of nontraditional forms of energy, putting into production new and technically complex consumer goods, environmental protection, and a number of other programs.

"The complexity and diversity of the tasks and the participation of a large number of organizations in their implementation require exceptional responsibility by all those who collaborate in their execution and a great deal of organizational work. After all, the failure to meet one small target of a program can lead to failure of fulfillment as a whole."

[Question] "Coordination of the work of those who are collaborating in its execution and personnel working with them [smezhniki] within the programs has been entrusted to the leading organizations, as is well known. Well, what about supervision?"

[Answer] "This is really a very important problem. In the plan to resolve it, the USSR State Committee for Science and Technology has made it incumbent upon the country's information organs to purposefully provide the collaborators with the necessary scientific and technical information and to actively accompany the operations by programs, that is, to continuously observe and supervise the course of fulfillment of program targets by enterprises and organizations in the field of activity of an organ of scientific and technical information. In our republic this function has been assigned to the MSSR Scientific Research Institute of Scientific and Technical Information and Technical and Economic Research.

"We have assigned all programs, their stages and specific targets to departments of the institute. This year, as an example, the department of industrial information is accompanying 46 stages of 17 programs, the department of agricultural information is following 18 stages of 11 programs, and so forth. A card file has been set up in the institute for these purposes. It makes it possible to issue the necessary data on those who are collaborating in parts of the republic and the number of targets and stages, and contains descriptions

of the operations subject to supervision and data on the course of their fulfillment. Institute staff members periodically go out to places and familiarize themselves with the progress of operations planned. In that way, the institute retains fulfillment of programs under supervision and informs the ministries, departments, party and planning organs, and the Committee for Science and Technology on the state of affairs."

[Question] "Today, very likely, it is unnecessary to convince anyone of the importance of special-purpose programs. May it be stated that fulfillment of one target or another has a priority nature for those collaborating in its execution?"

[Answer] "Last year the majority of collaborators met their targets. Examples may be cited of a responsible attitude toward the work. The collective of the Tiraspol' Foundry Machinery Plant imeni S. M. Kirov, for example, began series production of a completely automated line of highly productive equipment for foundry production stipulated by a program. The plant's workers also met their target in accordance with another program just as successfully and in the full amount. Nevertheless, I shall refrain from categorically responding to your question affirmatively. Other facts which exist, unfortunately, do not permit me to do this.

"The republic's Ministry of the Fruit and Vegetable Industry, for example, had a target in conformity with a special-purpose program in 1983 to conduct acceptance tests on experimental models of complete equipment units for packaging frozen fruit, berry and vegetable mixtures in polyethylene film, as well as to manufacture the first industrial batch of new types of products. These targets were frustrated. The reason: those collaborating in execution of the program--the Kaunas Polytechnical Institute and the Kaunas Automatic Food Machinery Plant--did not provide the necessary complete equipment units for the Ministry of the Fruit and Vegetable Industry. Those directly to blame for the failure are obvious, but after all, the Ministry of the Food and Vegetable Industry should not have remained a nonparticipant, but should have demonstrated the proper concern and a principled approach..."

[Question] "In speaking of the functions of your institute, you used the term 'accompaniment.' In its primary meaning, the shade of a certain passivity in your role is being overlooked. Is this true?"

[Answer] "Not at all. We do not limit ourselves to a statement of the state of affairs, and we strive to help in resolving problems which arise. For 1983, as an example, the MSSR Scientific Research Institute of the Food Industry received the assignment to create at the Kaushanskiy Canning Plant an experimental testing unit for the aseptic preservation of juice convenience foods [sok-polufabrikat] with the use of large-capacity tanks and to organize the production of a test batch of such products. Because of the lack of certain materials, the assignment was threatened with failure. We had to turn to the appropriate organizations, and the testing unit was made as a result.

"The target was not met in the full amount, nevertheless, but that is another aspect of the problem. The production association Zhdanovtyazhmash, in spite of promises, did not provide a special railway tank car to transport the aseptic preserved products for the Scientific Research Institute of the Food Industry. As it turned out, it did not have the necessary materials at its disposal.

"What does this say? That it is necessary to raise decisively the level of coordination and material support of special-purpose programs. Evidently, the appropriate national organizations must first of all ensure that the collaborating enterprises are provided with the necessary materials which are being funded.

"Another problem. In 1983 the Moldmeliovodstroy Trust did not meet the target for its program. It was 'helped' in this by the All-Union Institute of Water Polymers [vodopolimery] without the necessary technical documentation being presented. An appeal to the USSR Ministry of Land Reclamation and Water Resources to take appropriate steps did not receive a response. I would like the State Committee for Science and Technology, which has given us the right of supervision to take another step--to make it incumbent upon all those collaborating in the execution of special-purpose programs, regardless of their departmental or regional affiliation, to respond to the signals and inquiries of organs which are performing the functions of supervision.

"In our view, a system of measures is necessary to provide incentive to enterprises which are successfully working within the framework of special-purpose programs and penalties for those who ruin planned operations. The targets for special-purpose programs are not at all ordinary. They require both high responsibility by those who collaborate in their execution and provision of the appropriate motivation.

"Work within special-purpose programs by the republic's scientific organizations and enterprises is our contribution to solution of the most important national economic problems. Everything necessary must be done to ensure that this contribution is substantial and of high quality."

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CSO: 1814/102

## PROMOTION OF INVENTIONS DISCUSSED

Moscow SOVETSKAYA ROSSIYA in Russian 7 Feb 84 p 2

[Article by Ivan Yurchenko, political observer of SOVETSKAYA ROSSIYA: "Along a Closed Curve: Before the Risk Factor" under the rubric "Application Practice"]

[Text] Theory and practice. What an eternal issue. How often one hears and reads about the "ordeals" of solitary inventors who struggle for years and decades to win recognition for their projects and proposals, their failure to find anyone willing, so to speak, to listen to them, understand and grasp their ideas....

But it also happens differently. An invention is accepted and its application is commenced and enthusiasts are working on its practical uses but the matter becomes stalled and bogged down.

On this path there exists one nearly invisible barrier which arises after the project, its technical-economic substantiation and the blueprints are ready and it is time to make the final decision whether the innovation should be utilized or...perhaps more time is needed? Or should it be rejected? And someone's hand has trembled. This is a serious matter and one has to accept the responsibility for it. Yet anything that is new and not tried and tested may harbor problems. There is no utilization without a risk, no matter how small.

And temporizing begins. Temporizing during which the arguments used no longer are of a scientific or technological nature. Instead, what matters now is psychology and interpersonal relations among officials, the human element. Various vicious circles have to be broken out of.

I wish to offer here some food for thought.

### The First Circle: Exploration

This will concern just one scientific-technical project. But I would like to trace its fate from the very beginning, look at the situation through the eyes of persons playing various roles and understand their views and positions.

'SOVETSKAYA ROSSIYA' has already written about the utilization of the waste and rubbish dumps arising in modern cities. This is no trivial laughing matter.

From a city with a population of one million dump trucks transport each year half a million tons of so-called solid refuse. But it is not simply trash or rubbish. It also is a raw material that sometimes even is more valuable than minerals and ores. It consists of metal, textiles, wood. It means money! Yet we bulldoze it into dumps and pits....

All or nearly all of this trash can be recycled for industrial use. But waste-free technologies are needed. New technical projects are needed and are being explored....

But has not so far anything been developed in this field?

Roughly a year ago I happened to handle a protracted and tangled story relating to waste-free technology in precisely this very field--municipal communal management.

In the mid-1970s a group of scientific workers decided to try utilizing a new technique for processing refuse. The idea was based on experiments conducted at the Institute of High Temperatures, USSR Academy of Sciences, as a by-product of basic research.

The sense of the technical project can be summarized as follows: What happens to substances, materials, when they get heated? At some moment they ignite if, of course, there is an inflow of oxygen. But what if there is no oxygen?...While at the same time the temperature is continually rising...to, say, 1,700 degrees Centigrade? The substances disintegrate and melt.

This also is what happens, according to the project's authors, in a facility that would "ingest" refuse and issue three products: metal for remelting, liquid dross that could be cast into molds to get ready-made building materials and lastly, this being the most valuable and unexpected by-product, gas. In practice, this combustible gas is of the same kind which is extracted on oilfields and piped to power stations, plants and our kitchen ranges.

For now we will not consider the possibilities of this gas as a major power-plant fuel--that is a long-run prospect, but still it represents a substantial fuel source for boiler plants. At the same time the problem of refuse utilization is solved: instead of being discarded at dumps it will be utilized.

Is not this an alluring prospect?

Yes, of course, if one believes that this is not a pipe dream.

#### The Second Circle: Opinions

It was necessary to find out the opinions of knowledgeable people on this matter. I telephoned E. Sarnatskiy, deputy chairman of the Gosgrazhdanstroy [State Committee for Civil Construction and Architecture]. He was familiar with the matter. What is more, he believes that the methods of high-temperature pyrolysis (on which the innovation is based) are at present among the most promising technical solutions for the utilization of urban refuse. He said: "If you want to clear up details, come and look at the documents, talk with the experts who are directly working on it."

So far as opinions, judgments and expertises on this project are concerned, it can be said that they are positive. It was examined by the scientific council of the Gosgrazhdanstroy and the branch institutes of the Ministry of Ferrous Metallurgy, the Ministry of the Gas Industry, the Ministry of the Coal Industry and other authoritative institutions. Their responses were highly approving: "Timely and actual," "A noteworthy innovation and high quality of technical solutions," "A qualitatively new technological process for the complete utilization of material and energy resources," "Superior to domestic and foreign methods," "Practically excludes environmental pollution," "Draft the design of the pilot industrial facility," "Even now a pilot industrial enterprise based on domestically built equipment is possible."

As one reads these reports it might seem that there is cause for rejoicing.

And yet no progress has been made. The Gosgrazhdanstroy charged the TsNIIEP [Central Scientific Research and Design-Experimental Institute of Engineering Equipment] with the task of preparing the technical-economic substantiation and other needed documents for building the first pilot industrial facility. Qualified and energetic individuals undertook this work. The project chief engineer Yu. Sosner, the group leader A. Shrayman and other scientific associates investigated domestic and foreign experience in high-temperature pyrolysis, considered the comments and suggestions provided in the evaluations and found a site on which the facility could be most conveniently and economically built.

Moreover, the developers--again judging from the records--received substantial support from basic researchers--the Institute of High Temperatures, USSR Academy of Sciences, accepted the proposal to conclude an agreement for creative collaboration so as to bring the project to its completion.

A strange impression is produced as one leafs through these papers. Seemingly everyone is interested in advancing the matter and resolving it but some kind of outside force determined to leave it in abeyance seems to exist.

Consider one of the "threads" of correspondence.

The Gosgrazhdanstroy, believing that on the territory of the RSFSR urban beautification and ecology as well as technological progress in municipal services are handled by the RSFSR Ministry of Housing and Municipal Services, has proposed to it that it build a pilot industrial facility as the first step toward the application of the project. The Ministry in principle had no objections but it replied that that it first had to consult its subordinate Academy of Municipal Services. The Academy also has no objections but it believes that the new technique has first to be experimentally tested. In reply, the Gosgrazhdanstroy wrote that it was such testing that it meant. Inasmuch as the proposed refuse processing technique cannot be reproduced on a laboratory model, a facility is needed. The ministry again consulted the Academy. And again the reply saying in effect that they are not against it but it has to be tested first. But to this end the facility is needed and has to be built. But to this end....

Were all these letters and the replies to them written by the same man, it is to be supposed that he would say that the same old record is being played over



and over again. But the signatures are different. And the record rotates and rotates....

### The Third Circle: Doubts

Feeling confused by reading all this correspondence, I called the Academy and asked the name of the person directly in charge of this matter (I was racking my brain to know who was muddling things). They told me that the person in charge of this matter is candidate of technical sciences D. Ven'yamovskiy. I asked him whether the Academy had objections against the facility. No, he answered. What then is the matter? The point is that before the facility can be built, tests have to be carried out. And to this end a test stand is needed. What kind of test stand? The facility. Which has to be built?....

It is all very simple: at the Academy no one has yet undertaken to decide on the question whether to build or not to build.

And the point is not that the decision should be in favor of the innovation. An expert may turn it down on the basis of argument, proofs, calculations. But the opinion of the Academy of Municipal Services consisted precisely in that it essentially expressed no opinion.

Risk!....It is much simpler to remain neutral and turn on the "long-playing" record.

Last summer I was told that the innovation was submitted for consideration to the Glavmosdorupravleniye Main Moscow Road Administration (which handles beautification of the Nation's Capital). My inquiry produced an evasive reply: "It is difficult to reject this project (as if that were the problem!), but not everything is clear about it."

The other day a reply came from R. Vidleval'd, chief of the department for environmental protection and industrial processing of household refuse: "We hold to our opinion."

But what opinion?....In reply, he recommends asking the personnel of the technical administration of the Mosgorispolkom.

The chief expert at that administration B. Stolbov was in no hurry to express his opinion. He declared that the material was forwarded to "appropriate scientific research establishments." What establishments? It turns out that it was forwarded to the Academy of Municipal Services.

But perhaps I was under the impression that the doubters had some hidden reason? Could that reason be not personal motives and considerations but the desire to avoid a decision on a complex and unusual problem that from the scientific standpoint as well underlies this innovation? Although high-temperature pyrolysis in itself is not a new discovery, the proposed variant contains solutions that are indeed unfamiliar to many.

The most knowledgeable persons in this field are the scientists of the Institute of High Temperatures, USSR Academy of Sciences (IVTAN). Surely they could provide the confirmation or refutation of the main question: can refuse be processed by the proposed technique?

## The Fourth Circle: Personal Antagonisms

The director of the IVTAN Academician A. Sheyndlin shrugged his shoulders: "Why should this be doubted? The process in itself is feasible. Build the facility and it will process refuse."

Aleksandr Yefimovich mentions another aspect: "Is it needed?" And he points toward the window: "There's the solution of the entire problem."

Next to the Institute a refuse-burning plant is operating at full steam. "Burning?" "Yes. What more is needed?"

"However, let the economic executives decide what to do with refuse. Let the Ministry of Housing and Municipal Services or whoever else decide...."

Unexpectedly, it turned out from this conversation that the Institute properly speaking is neutral toward this project and neither did nor will handle it. The Institute has other more important problems.

Yes, the Institute deals in research into major basic problems. But then what about its creative collaboration with the developers? What about the agreement? Why did the Institute conclude it?

It turns out that the situation is now completely different. The IVTAN replied as follows to a request by the TsNIIEP to extend the joint research agreement for another year until the completion of the project: We have no objection to collaborating but "as regards the work on the high-temperature pyrolysis of refuse, no such topics are contained in the plans." The TsNIIEP requested that the IVTAN's associates be allowed to continue their research outside the plan on some other principles "in a form convenient to the Institute, "whether on the basis of an economic agreement, an agreement for creative collaboration, a consulting contract, etc." Again a refusal: "The associates named at present have other plan tasks and hence, unfortunately, it is not possible to divert them to the topic you propose."

What is the mystery surrounding these researchers whose time is so precious to the academic Institute? Why cannot it even release them for joint work with the developers in some convenient form? Not even on their days off?

These researchers happen to be...the authors of the project itself. More exactly, two of the three authors: Doctor of technical sciences P. Poletavkin and candidate of technical sciences V. Sariyev. When I wanted to speak with them, Poletavkin was sick but V. Sariyev showed up. My conversation with him left me dumbfounded. It turned out that the matter is not so simple. It involves complex personal antagonisms and passions that reached the white heat of the high temperatures themselves, so to speak.

V. Sariyev said: "I've long since been receiving no assignments. They simply are not giving me anything to do. They're dissatisfied with me."

"Why?"

"Because of this unlucky [pilot industrial] facility. And now they're even telling me to find another job elsewhere."

I tried to find out the reason. V. Sariyev has been working at the IVTAN for more than 20 years. He is a communist. He has worked on major topics and important research projects. He has been chief engineer, chief designer and the head of start-up work on a pilot industrial power station of a new type. There have been no complaints about his work, no reprimands.

I. Potekhin, deputy secretary of the party committee confirmed this: "Yes, Sariyev has been asked to find another job." "What was the reason?" "Because he has been pestering people about that pilot-industrial facility of his." I asked: "What about the Institute? Is it against it?" "No, it isn't and many people believe that it will have to be built all the same. But this topic is not in our research plan. We're an academic research institute."

So much for "collaboration"!

And what is the present fate of the project. What was the outcome of the correspondence with the RSFSR Ministry of Housing and Municipal Services? After all, that ministry did not arrive at any decision.

Problems of refuse processing are handled at the ministry by its main administration for urban beautification.

We are sitting in the office of the chief of that administration N. Kuznetsov. He describes the existing methods for refuse utilization. I ask his opinion on the technology of high-temperature pyrolysis. N. Kuznetsov listens with interest. This is the first time he has heard of it....He asks me where did I learn of it.

"I first learned of it at the IVTAN."

"How so? Wait a moment, please."

He telephones the Academy of Municipal Services and his experts and asks them to see him. Do they know anything about the new method? One of them recalls: "Someone came about it once...."

It was an awkward situation. Over there, at the Scientific Research Institute, at the Gosgrazhdanstroy and at the Mosgorispolkom disputes are under way whereas here....

Here, some people know of the project, others heard of it and others still have just learned of it from...a newspaper correspondent. They had forgotten about their correspondence. Their file folders are covered with dust.

BUT HOW LONG WILL THIS MATTER CONTINUE TO BE TRAPPED WITHIN THESE VICIOUS CIRCLES?

A week ago I was told that the documents on the proposal and the facility have been forwarded to the VIVR [expansion unknown]. Finally.

I called that institute. "Yes", I was told, "We received the documents. But that's high-temperature pyrolysis. That's something new to us. We work in other directions. This project was sent to us by mistake. We returned all the documents." "To whom?" "We have to clear this up."

Whom to telephone now? B. Stolbov? D. Ven'yamovskiy? R. Villeval'd? N. Kuznetsov? Back to the second circle or to the third circle?

I called. Again I hear: "Transmitted for consideration." "Where?" "I have to find out more exactly."

The track is disappearing. It has to be found again.

But perhaps it is time to stop turning within this vicious circle and sum up the situation.

Consider: no one was opposed. No one has cited major and weighty arguments against the idea of that project. To be sure, two or three experts expressed doubts about some details. But they were not certain: they claimed that it could be this way or perhaps also that.

That is how innovations get stalled and pigeonholed: people whose official duty it is to investigate the matter and formulate a specific and argued opinion and decide on the matter--for or against--prefer to be evasive, to stand aside and backstage as it were.

And in the meantime on the stage itself, in the spectator's view, a unique drama is played out. A drama of ideas, opinions, antagonisms but in the absence of the main characters, of those on whom, in the final analysis, hinges both the disentangling of the plot and the outcome.

1386

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## AZERBAIJAN ACADEMY OF SCIENCES GENERAL MEETING HELD

Baku BAKINSKIY RABOCHIY in Russian 20 Dec 83 p 1

[Article: "General Meeting of the Azerbaijan SSR Academy of Sciences"]

[Text] The general meeting of the Azerbaijan SSR Academy of Sciences took place on 19 December. It discussed organizational problems.

The general meeting complied with the request of G.B. Abdullayev, corresponding member of the USSR Academy of Sciences and academician of the Azerbaijan SSR Academy of Sciences, to free him from the duties of president of the Azerbaijan SSR Academy of Sciences. The gathering expressed its gratitude to Comrade G.B. Abdullayev for his many years of service in leadership of the academies.

The gathering unanimously elected E. Yu. Salayev, academician of the Azerbaijan SSR Academy of Sciences as president of the Azerbaijan SSR Academy of Sciences.

Speakers at the meeting included Azerbaijan SSR Academy of Sciences academicians Ch. M. Dzhubarly, M.I. Aliyev, I.A. Ibragimov, I.I. Ibragimov, Z.M. Bunyatov, M.T. Abasov, Sh.F. Mekhtiyev, and N.A. Guliyev.

The first secretary of the Azerbaijan Communist Party Central Committee Comrade K.M. Bagirov spoke at the meeting.

He noted that by increasing the quality and efficiency of scientific research, in recent years Academy scientists have achieved important successes in strengthening the ties of science with production and made an important contribution to the development of the republic economy. The scientific potential of the Academy of Sciences increased substantially and its material-technical base was strengthened. And these successes to a significant extent are tied to the practical activities of Comrade G.B. Abdullayev. On behalf of the Azerbaijan Communist Party Central Committee Comrade Bagirov expressed gratitude for his many years of active work.

He characterized Azerbaijan SSR Academy of Sciences academician E. Yu. Salayev as a prominent physicist who has made a significant contribution to working out a number of scientific problems which have all-Union significance. Comrade Bagirov expressed confidence that E.Yu. Salayev, using his experience, knowledge and organizational talent, would be able to insure the successful activity of the Azerbaijan Academy of Sciences.

In the name of the Central Committee, for himself, and on behalf of the meeting he congratulated E.Yu. Saleyev on his election to this responsible post and wished him and the whole collective of the Academy of Sciences great successes in implementing the tasks which face them following the decisions of the 26th CPSU Congress, the 30th Congress of the Azerbaijan Communist Party and the program speeches of General Secretary of the CPSU Central Committee and Chairman of the Presidium of the Supreme Soviet Comrade Yu. V. Andropov.

Comrade Bagirov noted detailed discussions of the achievements and shortcomings in academy activities in recent years took place at plenums of the Azerbaijan Communist Party Central Committee in July and December of this year. Consequently there is no need to dwell on them in detail again. At the same time, taking advantage of the occasion, I would like to speak briefly about the main tasks of the Academy of Sciences, whose activities still do not fully meet the requirements of the party and the government in the current phase of public-social development.

Academy scientists have insufficient impact on increasing the efficiency of public production growth in labor productivity and economic and social development of the republic. Scientific institutions have not secured close cooperation with industrial and agricultural production and are doing a poor job of taking advantage of the experience of progressive scientific centers of the country in solving intersectorial and regional problems, in organizing scientific-production cooperation with enterprises and associations of national economic sectors, and accelerating introduction of the results of science into operation.

Scientists' efforts should be directed at key fundamental and applied research based on urgent needs of the development of the republic economy; unjustified parallelism and insignificant subjects which do not deal with fundamental problems should not be tolerated; and research on contract subjects should be widely developed.

Work must be more persistently carried out on deepening integration of science with production, devoting special attention to problems of expanding the network of scientific-production associations. Decreased periods of development and introduction of progressive technology, equipment, instruments and materials must be achieved in creative cooperation with enterprises.

The Presidium of the Academy of Sciences is obliged to promote a sound ratio of expenditures for scientific research and experimental design development and allocation of efforts and means in those directions of science which make it possible to more efficiently and in shorter periods of time raise the level of public production even higher and to accelerate its conversion to the intensive path of development.

Serious shortcomings continue to occur in the organization of science management and in coordination of efforts of academic and sectorial scientific-research institutes and VUZes of the republic. The presidium and party committee must strengthen management of all links of scientific exploration, improve management of science, and facilitate broad introduction of target-program planning.

Consideration and ratification of a program should be based on the republic's specialization in all-Union distribution of labor, future directions of economic development, further improvement of its structure, and more efficient utilization of existing scientific-technical and production potential.

A substantial increase in the contribution of scientists to the development of industry and the agro-industrial complex, increased efficiency of the republic petrochemical complex, expansion of the mineral-raw materials base, creation of fundamentally new non-waste and energy-saving technology, and implementation of rational use of nature must be insured.

A decisive turn by social scientists to practical tasks must be achieved and elaboration of socio-economic problems of the comprehensive development of the republic's production forces, specialization, and cooperation of production and contemporary social processes should be intensified. They must increase the ideological-theoretical level of their research in every possible way and intensify the struggle against anti-Marxist and revisionist concepts.

Problems of training, indoctrinating, and placing highly skilled scientific personnel are assigned an especially important role in implementing plans for scientific technical progress. Here the task boils down to providing all sections and areas of science with mature, competent personnel and instilling in them a feeling of high civic concern and the deepest responsibility before the people for performing their professional and social duty.

The Academy of Sciences party committee must actively and skillfully direct the scientific life of the collective, mobilize efforts of scientists and specialists to accelerate scientific-technical progress, be very demanding, and conduct purposeful, persistent work on strengthening discipline and improving organization of labor and creating a healthy moral atmosphere in scientific institutions.

The many-thousand member collective of the republic Academy of Sciences, Comrade Bagirov said in conclusion, faces a great deal of work on increasing efficiency of utilizing scientific potential and fulfilling the decree of the CPSU Central Committee and USSR Council of Ministers "Measures to Accelerate Scientific-Technical Progress in the National Economy." On behalf of the Central Committee of the republic's Communist Party he expressed confidence that communists and all associates of the Academy of Sciences would apply maximum efforts to fulfill the tasks established for them by the party and government.

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CSO: 1814/90

## GENERAL MEETING OF LATVIAN ACADEMY OF SCIENCES HELD

Riga SOVETSKAYA LATVIYA in Russian 11 Nov 83 p 1

[Article: "Increase the Efficiency of Scientific Research"]

[Text] A session of the general meeting of the republic's Academy of Sciences took place in Riga on 10 November. Prominent scientists, administrators of scientific-research institutes and VUZes, and representatives of public organizations of the republic's capital gathered in the conference hall of the tall Academy building.

The president of the Latvian SSR Academy of Sciences and Hero of Socialist Labor A.K. Malmeyster presented a report "The Tasks of the Latvian SSR Academy of Sciences to Fulfill Party and Government Decisions on Science and Scientific-Technical Progress." He noted that the June 1983 Plenum of the CPSU Central Committee was an important political event in the life of the country. The Plenum established important directions of the multi-faceted constructive activity of the party and the Soviet people in the current phase and designated precise reference points of our historical progress in the near and distant future. The efforts of the party and people are now focussed on systematic and comprehensive improvement of developed socialism. The role of science in implementing this important task is exceptionally great. "Uniform scientific-technical policy is assuming crucial significance today," Yu. V. Andropov, General Secretary of the CPSU Central Committee and Chairman of the Presidium of the Supreme Soviet of the USSR, said in his speech at the Plenum. Combining the advantages of the socialist system with achievements of the scientific-technical revolution has especially urgent significance since the development of science and engineering has become one of the primary aspects of the competition between socialist and capitalist systems.

The party and government are devoting a great deal of attention to scientific-technical progress. This year the CPSU Central Committee, and the USSR Council of Ministers, the Latvian Communist Party Central Committee, and the republic Council of Ministers adopted a number of decrees aimed at increasing the level and success of research and introducing scientific developments into production extensively. These important documents have become a program of action for the republic's scientific collectives, which are endeavoring to make a large contribution to further increasing efficiency of public production, labor productivity, and economic and social development of the country and republic.



In the first two and one-half years of the 11th Five-Year Plan, 308 developments of Latvian academic institutes were introduced into the national economy. Research on 447 economic contracts was completed totalling 15.1 million rubles. Twelve foreign trade agreements were concluded. Three hundred fifty inventions have become a good stockpile for the future. Significant work on developing agro-industrial associations -- a fundamentally new form of agricultural production organization -- was done at the Academy. The economic effect from creating just the Tallinn RAPO[Rayon Agro-Industrial Association] amounts to about 5 million rubles a year. These associations are now operating in all rayons of the republic.

The subject area of work being done under the Food Program is extensive. It is closely tied to fundamental improvement of feed production and increased crop yield and field productivity. Research on creating composite polymer materials and articles from them with pre-assigned features is also urgent. Significantly improving technological processes will make achievements in plasma chemistry and in magnetohydrodynamics possible. For the first time in the country Latvian chemists have incorporated the complex technology of peptide synthesis and have already produced experimental batches of new compounds for medicine and agriculture. Technology for obtaining synthetic prostaglandin has also been developed, for the first time in the USSR, which makes it possible to organize industrial production of domestic prostaglandin medicines. Research in the field of wood processing, developing the fuel-energy complex, creating multiple computer systems and networks, and protecting metals against corrosion are of great importance for the national economy. The republic Academy of Sciences has been taking an active part in developing the regional comprehensive program for scientific-technical progress of the Latvian SSR for 1986-2005, which aims at solving key problems.

Discussing the results of our activities, the president of the Academy said, we, more over are considering how to achieve the greatest degree of purposefulness and fruitfulness in our work and how to better help to fulfill contemporary economic and sociopolitical tasks. And there are still quite a few opportunities here. Forms of cooperation with production must be improved, more initiative must be shown in creating sectorial scientific laboratories directly at enterprises, and research on contract subjects must be conducted on a wider scale. Steady attention should be paid to economic substantiation of proposals designed to be applied in the national economy and we should aim at maximally introducing worthwhile recommendations into practice. A guarantee of further success lies in utilizing these and other reserves of strengthening scientific potential.

Academician and secretary of the social sciences department V.A. Shteynberg presented a report "Urgent Questions of the Social Sciences in the Republic in Light of Decisions of the June 1983 Plenum of the CPSU Central Committee and the July 1983 Plenum of the Latvian Communist Party Central Committee." He noted that practices in the development of science show that its humanitarian fields -- such as economics, philosophy, sociology, history, law, literature, linguistics, and others -- are moving forward in their role in the life of society today. This is dictated by the needs of our dynamic century and by the demands of a developed socialist society.

The Communist Party, closely tied to practice and following Leninist traditions, set a striking example of profound understanding of societal patterns and tendencies of economic, spiritual, and ideological development. The party proposed an extensive program of actions outlined by the 26th CPSU Congress and the June Plenum of the CPSU Central Committee. In June of this year a plenum of the Latvian Communist Party took place at which the condition of social science research in the republic was analyzed in detail and measures were proposed which had an enormous significance for the further development of research and for solving urgent problems of ideological and mass-political work in the republic. The need to "devote a great deal of attention to problems of planning and efficient organization of scientific research, phenomena, and processes of social life in the stage of mature socialism, and to increase demands as to the style and methods of work of scientific and VUZ collectives. . .", was emphasized at the plenum, and fair criticism was directed at the republic Academy of Sciences' Institute of Language and Literature.

All these important directives became subjects of serious discussion in social science institutes; thorough analysis was carried out of all that had been done and not done and work plans were re-examined and at times substantially changed. On the whole during discussions, work on studying the history of the Latvian people, the revolutionary struggle of laborers in Latvia, and the enormous political and social achievements in building socialism and communism in the Latvian land were successfully evaluated. Research in the field of economics, international phenomena, the Latvian language, our cultural legacy, and some important problems of dialectical and historical materialism was fruitful. At the same time greater demands have been made on the social sciences today. The party is calling for a new, higher level of ideological-theoretical work, and from economists, philosophers, historians, sociologists, psychologists and lawyers it expects development of scientific paths to increase the efficiency of production, research of the patterns of formation of a classless structure of society, internationalization of social life, development of the socialist people's power, and social consciousness and solutions to problems of communist indoctrination.

In adjusting research plans every humanitarian institute made a special report to a Presidium of the republic Academy of Sciences. The actual state of affairs and capabilities of the institutes were analyzed in detail. For example, the Institute of Economics, relying on already existing reserves, proposed intensifying research in the field of improving the production relations of socialism, summarizing experience of the RAPO, and improving the economic mechanism of the development of the agro-industrial complex of the republic and the country. Certain themes which were less urgent were curtailed at this and other institutes and concentration of efforts on more important directions was thought out. A number of other measures were also adopted which promote a decisive turn-around for social scientists to actual practical tasks, to intensifying elaboration of problems of developed socialism and to the study of history and the cultural legacy of the past. All this should give, and we are confident that it will, the speaker said, appropriate outlets to practical work and will lead to formulating practical recommendations which comply with the demands of the party and government.

Furthermore, the speaker dwelled in detail on questions of counterpropaganda, which acquires special significance in connection with the aggravated international situation. The speech emphasized that the duty of every scientist is to convincingly demonstrate the historical truth and power of our theoretical positions and to actively expose anti-scientific bourgeois concepts.

There is every reason to say that scientific-research work plans in the social sciences field may be performed with high quality and on schedule, the speaker said in conclusion. Scientists are full of the resolution to apply maximum efforts so that the significance of social sciences may be raised to the level of the demands of the complex time in which we are living, building a new social world, and establishing the most humane relations of man to man.

V.M. Krumin', deputy chairman of the Latvian SSR Council of Ministers, academicians V.P. Grigulis, B.A. Purin, R.Ya. Karklin', and corresponding member of the Academy V.O. Miller, and V.V. Doroshenko spoke at the session of the general meeting.

Participants in the general meeting adopted a decree which established practical tasks for Latvian scientists to fulfill the decisions of the June 1983 Plenum of the CPSU Central Committee and the July Plenum of the Latvian Communist Party Central Committee.

Participants in the session unanimously approved the course of the party to preserve peace and prevent thermal nuclear war and expressed strong confidence that the creative energy of scientists and their new achievements will serve to strengthen the power of our Native Land.

Taking part in the work of the session were comrades I.A. Anderson, E.M. Ozols, deputy chairman of the Presidium of the Latvian SSR Supreme Soviet V.A. Blyum, deputy chairman of the Council of Ministers and representative of the republic Gosplan M.L. Raman, and department chief of the Latvian Communist Party Central Committee V.S. Klibik.

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## UKRAINIAN ACADEMY OF SCIENCES HOLDS GENERAL MEETING

Kiev PRAVDA UKRAINY in Russian 9 Dec 83 p 3

[Article: "The Most Important Tasks of Scientists: General Meeting of the Ukrainian SSR Academy of Sciences"]

[Text] The progress in fulfilling decisions of the June (1983) CPSU Central Committee Plenum in institutions of the Ukrainian SSR Academy of Sciences was examined at a general meeting of the Ukrainian SSR Academy of Sciences held in Kiev on 8 December.

Academician B. Ye. Paton, president of the Ukrainian SSR Academy of Sciences, gave a report in which he noted that as with all laborers of our country, the republic's scientists fully recognize the long-term nature of the Central Committee plenum's decisions and their enormous organizational and political significance. As they see it, their priority task is to significantly raise the contribution of every scientific collective to accelerating scientific-technical and socioeconomic progress and to improving communist indoctrination.

Wide prospects for further growth in the effectiveness of science and of its role in improving social production are being opened up by the CPSU Central Committee and USSR Council of Ministers decree "On Measures to Accelerate Scientific-Technical Progress in the National Economy." The Presidium of the Ukrainian SSR Academy of Sciences has developed specific measures for implementing this decree. They are aimed at expanding purposeful fundamental research in the social, natural and technical sciences, at creating new progressive production procedures, at widening the scale and reducing the time of their introduction, at improving the organization and planning of scientific research and at strengthening ties with production. Activating the efforts of scientists of the Ukrainian SSR Academy of Sciences in completing these tasks should be viewed as the most important indicator of their ideological maturity. These tasks must be completed in integration, on the basis of an organic unity of ideological indoctrination, political, organizational and economic activity. The search for new forms of interaction between science and production, ones which would make it possible to surmount manifestations of bureaucracy and unwarranted promotions and to actively shape a new type of economic thinking, is acquiring important significance in this regard.

This report and subsequent statements contained numerous examples of fruitful cooperation between scientific and production collectives, cooperation which is

insuring solution of major scientific-technical problems, and swift and extensive introduction of models of progressive technology, materials, and especially fundamentally new production procedures into practice. Mention was made of the need for intensifying party influence on the efforts to deepen the integration of science and practice. The great mobilizing significance of the Council for Cooperation in Scientific-Technical Progress created under the Ukrainian SSR Communist Party Central Committee was emphasized.

Much attention was devoted in the meeting to the social scientists, who must now deepen their theoretical research on social processes, work out substantiated forecasts of social development and subject conceptions hostile to socialism to grounded criticism. It was noted that the presidium of the academy of sciences and the Social Sciences Section are concentrating the efforts of social scientists on solving fundamental problems of developed socialism, on raising labor productivity, on improving production relations and on forming communist conviction. Institutions involved in the social sciences have now stated the orientation of their work more clearly. Research is being conducted precisely on those problems which are being posed by the party as having priority to the development of society and to formation of the new man. Positive changes were noted in the effort to raise the practical payoff of the social sciences, and to develop scientific conceptions and forecasts and the methods of controlling complex social processes. At the same time the social scientists must significantly raise the methodological level of their research and deepen development of the scientific principles of ideological work.

It was noted in the report and in subsequent statements that institutions of the Social Sciences Section of the Ukrainian SSR Academy of Sciences must analyze the trends of social development more deeply and raise the philosophical, ideological and theoretical level of the research and its educational function. We need scientifically substantiated proposals on ways to raise production effectiveness, stimulate scientific-technical progress, improve the planning and control system, achieve a classless structure in the society, internationalize its social and spiritual life and solve the problems of communist indoctrination of laborers.

Ideological and mass political work, the speakers said, must be directed at raising the political awareness and activating the work of the colleagues of scientific institutions, subordinating this effort to solving the problems of accelerating scientific-technical progress and the fundamental problems of modern science and technology.

Emphasis was laid on the need for devoting more attention to indoctrination of scientists within the socialist formation--scientific workers whose professional competency must be combined with deep devotion to the party. A healthy moral climate must be created in the scientific collectives, executives must be trained for scientific subdivisions, and a worthy replacement must be nurtured. Questions were raised concerning improvement of publicity on the achievements of scientists provided by the mass media and propaganda.

A. S. Kapto, a Politburo member and the secretary of the Ukrainian Communist Party Central Committee, spoke at the meeting.

Focusing on the main tasks of social scientists implied by the requirements of the June Plenum of the CPSU Central Committee, he noted that special attention must be turned to theoretical study of the entire complex of problems raised at the Central Committee plenum by Comrade Yu. V. Andropov in connection with the drafting of a new edition of the CPSU Program.

The proceedings and the entire spirit of the Central Committee plenum also require that scientists make a resolute turn toward intensive preparation of good practical recommendations for both the short and the long term. Comrade V. V. Sherbitskiy's suggestion for creating a single sociological service in the republic, proposed at the June (1983) Plenum of the Ukrainian Communist Party Central Committee, must be carried out. This will promote formation of a special subdivision of applied sociology in the Ukrainian SSR Academy of Sciences.

A serious effort must be made, especially by institutions having an economic profile, to develop proposals for conducting an economic experiment in compliance with the CPSU Central Committee and USSR Council of Ministers decree on additional measures for broadening the rights and strengthening the responsibility of industrial enterprises and associations for the results of their business activities.

The speaker noted the timeliness of the effort being made by scientists of the republic's academy of sciences and its Social Sciences Section to strengthen counterpropaganda, and of the need for making more effective use of the possibilities of social scientists for these ends.

One important problem, A. S. Kapto said, was that of strengthening comradely ties of social scientists with natural scientists and engineers. A certain amount of experience has already been accumulated in this area. However, life demands closer ties between the different sectors of modern science. We obviously also need to think about developing a republic integrated program of scientific research on the pressing problems of ideological and mass political activity.

A significant amount of attention was devoted in the statement to the ways of improving political indoctrination in academy collectives. Mention was made of the positive experience acquired by the party organizations of the Institute of Electric Welding imeni Ye. O. Paton and the physicochemical, technical mechanics, state and law and a number of other institutes. Experience persuades us that we need to select those forms and methods of ideological influence which would insure an integrated approach. The leading role is played here by instructor training seminars; their practical return is growing tangibly. However, the discussion of philosophical problems is sometimes superficial in nature. We need to significantly improve political information in academy collectives. Their party and social organizations must devote more attention to the moral and ethical aspects of the life of the collectives, and to the political improvement of scientific workers.

Describing the scientific propaganda activity of academy scientists, A. S. Kapto noted the great significance of personal participation of leading scientists

in it. They must set the tone in this important effort. This is precisely the approach being taken by Academician B. Ye. Paton. Millions of people know him not only as an outstanding scientist, organizer and prominent public official, but also as a remarkable information specialist and propagandist. Those who read, watch and listen to scientific propaganda always display a desire to meet with academicians P. G. Kostyuk, O. K. Antonov, A. S. Davydov, A. V. Kirsanov, Yu. A. Mitropol'skiy, V. I. Shinkaruk and many others. Academician V. M. Glushkov was a brilliant popularizer and propagandist of scientific knowledge.

The arsenal of the scientists contains many effective methods of scientific propaganda work. Meetings and lectures at plants and factories and science days have become regular functions for them, and popular science films made with the participation of scientists are being shown successfully. However, the times require a significant increase in the contribution of scientists to mass political work and to propaganda in the republic. They must participate more actively in the activities of the Znaniye Society. The wish was expressed that the entire complex of issues concerned with scientific propaganda activity of scientists would become an object of special examination by the presidium of the republic's academy of sciences.

Today as never before, A. S. Kapto noted in conclusion, the authority of science is high, and the labor of scientists is difficult but respected. The responsibility of scientists is higher than ever before. This is especially important to consider in the face of the present informational situation, which has been sharply complicated by American imperialism. There can be no doubt that scientists and all colleagues of the Soviet Ukraine's Academy of Sciences will continually increase their contribution to implementing the decisions of the 26th CPSU Congress and the June Plenum of the CPSU Central Committee.

Statements were given at the general meeting by Academician P. G. Kostyuk, director of the Institute of Physiology imeni A. A. Bogomolets of the Ukrainian SSR Academy of Sciences, and by the following academicians of the Ukrainian SSR Academy of Sciences: Ukrainian SSR Academy of Sciences vice president I. I. Lukinov, chairman of the Western Scientific Center of the Ukrainian SSR Academy of Sciences Ya. S. Podstrigach, director of the Institute of Social and Economic Problems of Foreign Countries of the Ukrainian SSR Academy of Sciences A. N. Shlepakov and department director of the Institute of Radiophysics and Electronics of the Ukrainian SSR Academy of Sciences A. Ya. Usikov. Statements were also made by the following corresponding members of the Ukrainian SSR Academy of Sciences: V. I. Yurchuk, director of the Institute of Party History of the Ukrainian Communist Party Central Committee, affiliated with the Institute of Marxism-Leninism of the CPSU Central Committee; V. P. Kukhar', academician-secretary of the division of chemistry and chemical technology of the Ukrainian SSR Academy of Sciences and chairman of the republic Council of Young Scientists and Specialists of the Ukrainian Komsomol Central Committee and of the Presidium of the Ukrainian SSR Academy of Sciences; V. I. Kutsenko, deputy academician-secretary of the division of history, philosophy and law of the Ukrainian SSR Academy of Sciences; Ye. I. Andreyuk, chairman of the joint trade union committee of the Ukrainian SSR Academy of Sciences; I. A. Dzeverin, director of the Institute of Literature imeni T. G. Shevchenko of the Ukrainian

SSR Academy of Sciences; and M. S. Koval'chenko, secretary of the party committee of the Institute of Problems of Material Science of the Ukrainian SSR Academy of Sciences.

The participants of the meeting approved the Declaration of CPSU Central Committee general secretary, Chairman of the Presidium of the USSR Supreme Soviet Yu. V. Andropov which aptly rebuked militarists.

The general meeting of the Ukrainian SSR Academy of Sciences adopted a resolution spelling out measures aimed at reinforcing the efforts of the collectives of the republic academy of sciences to implement the decisions of the June (1983) CPSU Central Committee Plenum.

Ukrainian SSR Council of Ministers deputy chairmen S. I. Gurenko and M. A. Orlik and director of the division of science and educational institutions of the Ukrainian Communist Party Central Committee F. M. Rudich took part in the meeting.

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CSO: 1814/91



ESTONIAN ACADEMY OF SCIENCES DISCUSSES PRESENT AND FUTURE OF RESEARCH PROGRAMS

Tallinn SOVETSKAYA ESTONIYA in Russian 15 Dec 83 p 3

[Article: "Program Research: Results and Prospects"]

[Text] All-out development and intensification of the economy would be unimaginable without accelerated introduction of the results of scientific research and development into practice. This is being promoted in many ways by coordination and planning of research on the basis of the program method, which insures the most sensible distribution of manpower and resources for solving important national economic problems.

The effectiveness of introducing the programs adopted in the republic and the prospects for developing new ones were discussed at a general meeting of the Estonian SSR Academy of Sciences held on 14 December in Tallinn.

A report was given by USSR Academy of Sciences Corresponding Member K. Revane, president of the Estonian SSR Academy of Sciences; statements were also made in subsequent debates by Estonian SSR Academy of Sciences academicians M. Veyderma and Kh. Khaberman. The speakers noted that 10 republic integrated scientific-technical programs had been drawn up by scientists of the Estonian SSR Academy of Sciences by this date. Of these, eight had already been approved by the Estonian SSR Council of Ministers. It was emphasized that the results of research conducted in accordance with the scientific-technical programs are already enjoying broad application in the national economy.

One of the first developments of this sort was the program "Integrated Use of Oil Shale." It has great significance to providing the country with effective sources of energy capable of replacing petroleum.

Methods of manufacturing some especially pure substances were introduced into production within the framework of the program "Drug Biochemistry," and scientifically substantiated methods of obtaining prostaglandins were developed. The first experimental consignments of this important drug, one which has great significance to medicine, agriculture and other sectors, were manufactured. Specialists managed to find an "antitoxin" capable of protecting potatoes from four types of especially dangerous viruses. Their production has already begun. Joint work is being done with the Yarva-Yaani Kolkhoz with the purpose of obtaining an absolutely healthy seed fund. Efforts directed at preserving

human health are proceeding successfully. Antibodies capable of helping us to conquer one of the most dangerous diseases--viral hepatitis--and substances effective against some other viral diseases have been obtained.

Newsurface-active substances have been developed. The preparation "Ester-3," which satisfies the world standards, is being introduced into production successfully at the Kiviylä Shale and Chemical Combine. The first consignment of this preparation has already been obtained for use in the republic's national economy. Estonian chemists working in the program titled "Fine Organic Synthesis" have managed to develop resources necessary to control plant pests. This is an important step in the Food Program.

Scientific experiments cannot be conducted at a modern level without sophisticated research methods. The successes of specialists in nuclear magnetic resonance are promoting solution of this problem.

As should be expected, the significance of the applied sciences is growing today; the forms of communication between science and production are improving. To preserve the necessary proportions between fundamental and applied efforts, to achieve consistent improvement of the material base of scientific institutions and to replenish the ranks of highly qualified researchers, we need to develop and allocate the scientific potential in an economically justified way. Academy specialists have done a significant amount of work in this area.

Great is the contribution of scientists to working out the ways of developing and distributing all of the republic's productive resources; they have done so within the framework of a program of integrated development of scientific-technical progress.

Another topic discussed at the meeting was the need for attaching preference in the future to those projects which, besides having doubtless fundamental value, may have a significant influence on the state of the economy's primary areas. It was emphasized that the stronger and stronger union between science and practice also requires continual improvement of the forms of control over scientific research, and fundamental updating of the methods of introducing research results into practice. In this connection academy scientists face great and important tasks, which must be the focal point of all of our efforts.

A decision was adopted in correspondence with these sentiments.

A group of scientists was awarded P. Kogerman commemorative medals. Estonian Communist Party Central Committee Secretary R. Ristlaan and director of the department of science and educational institutions of the Estonian Communist Party Central Committee A. Aben took part in the general meeting of the Estonian SSR Academy of Sciences.

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## ESTONIAN ACADEMY OF SCIENCES MEETS TO DEFINE RESEARCH DIRECTIONS

Tallinn SOVETSKAYA ESTONIYA in Russian 24 Nov 83 pp 1, 3

[Article: "The Main Directions"]

[Text] The main directions for raising the effectiveness of scientific research and insuring its fastest possible introduction into practice were determined at a general meeting of the Estonian SSR Academy of Sciences held in Tallinn on 32 November.

Opening the meeting, president of the Estonian SSR Academy of Sciences, Corresponding Member of the USSR Academy of Sciences K. Rebane emphasized the principal tasks facing the republic's scientists in regard to solving the problems of raising labor productivity and reinforcing the scientific-technical potential in all spheres of the economy.

Vice president of the Estonian SSR Academy of Sciences, Academician of the Estonian SSR Academy of Sciences A. Käärna reported on the participation of scientists of the Estonian SSR Academy of Sciences in fulfillment of the decisions of the June (1983) CPSU Central Committee Plenum.

Participating in 18 all-union and 10 republic integrated scientific programs, institutions of the Estonian SSR Academy of Sciences are making their contribution to solving important scientific-technical and socioeconomic problems, he said. The new tasks posed before Soviet science at the plenum and the criticism addressed at scientists have made it necessary to seriously analyze what has been done and to raise the level of research, the effectiveness of solving applied problems and the effectiveness of introducing scientific discoveries into practice.

The speaker went on to discuss the main results of research conducted by institutions of the Estonian SSR Academy of Sciences. The collective of the Institute of Experimental Biology is participating actively in the Food Program. Integrated programs have produced results opening up new prospects for intensifying agriculture. Theoretical research conducted by biologists is becoming the basis for many experiments performed by specialists of agricultural scientific research institutes and by breeders of the republic.

The Chemistry Institute occupies a leading place in synthesizing resources which would protect plants from insect pests but which would be harmless to man and animals. Almost two-thirds of all pheromones subjected to testing on the country's fields, in orchards and forests were created by Estonian chemists. Preparations against orchard and hothouse pests have also been developed. Effective feed preservatives were a practical result of the joint work of the Institute of Chemical and Biological Physics, and the research organizations and experimental farms of the Estonian agroindustrial complex. Research by scientists of the Institute of Astrophysics and Physics of the Atmosphere are providing assistance in studying biomass accumulation by plants. Power engineering specialists of the Institute of Thermophysics and Electrophysics determined the technical-economic grounds for economical use of electric power to heat rural settlements. Developments by scientific economists aimed at improving labor organization and the economic mechanism were introduced into the Estonian agroindustrial complex.

Noting the growing significance of the social sciences, A. Käärna said that on the whole, research conducted by social scientists of the Estonian SSR Academy of Sciences may be evaluated as being topical, oriented at solving the most important problems of socioeconomic development and ideological work. This year collective works on integrated planning of scientific-technical progress and on development and distribution of productive forces in the Estonian SSR were completed.

The speaker went on to discuss the problems associated with improving historical, sociological and philosophical research conducted by social scientists. The institutes of history and of language and literature of the Estonian SSR Academy of Sciences are playing a significant role in improving international education and developing culture and art. However, there is still considerable room in this area for active participation by scientists in research on the pressing problems of our society.

Estonian SSR Academy of Sciences Academician I. Epik, vice president of the Estonian SSR Academy of Sciences, devoted his speech to the tasks of the Estonian SSR Academy of Sciences in light of the CPSU Central Committee and USSR Council of Ministers decree "On Measures to Accelerate Scientific-Technical Progress in the National Economy."

Sensing the constant concern of the party and government for developing the country's scientific-technical potential, the scientists of the Estonian SSR Academy of Sciences are applying all of their effort to raise the welfare and cultural level of the people and to strengthen the motherland's economic power, he said. The republic's scientists are working on a large number of scientific programs: integrated and sensible use of combustible shale and phosphorites, drug biochemistry, biotechnology, fine organic synthesis, computer technology and so on. However, the organizational effort still does not fully satisfy the high requirements of today.

There is still much to do to hasten introduction of scientific developments into practice. We need to strengthen and modernize the experimental and

production bases of the organizations and enterprises through which the innovations of the scientists pass on their way into industry.

Among the fundamentally new developments of scientists of the Estonian SSR Academy of Sciences, I. Epik named the discovery, by Tartu physicists, of the unique properties of information accumulation in crystals by means of a laser beam. These crystals will enjoy broad application in computer technology. The need now is to effectively solve the problems of introducing this promising technology into domestic industry. Chemical scientists have synthesized effective preparations for agriculture and medicine superior to foreign counterparts. The Experimental Plant of Organic Synthesis and Biopreparations of the Estonian SSR Academy of Science Institute of Chemistry is to be expanded to permit their mass production.

I. Epik concluded by describing the basic directions of scientific research in institutions of the Estonian SSR Academy of Science and the tasks associated with strengthening the ties between science and production, and he dwelled on training provided to scientific personnel. In behalf of the participants of the general meeting of the Estonian SSR Academy of Sciences he promised the party and government that scientists of the Estonian SSR Academy of Sciences will do everything to complete their tasks.

In its resolution, the general meeting of the Estonian SSR Academy of Sciences unanimously approved the decisions of the June (1983) CPSU Central Committee Plenum and spelled out specific measures for eliminating shortcomings in the work and increasing the contribution of scientists to solving the pressing socioeconomic and sociopolitical problems of the society of developed socialism.

Estonian Communist Party Central Committee Secretary B. Saul and Estonian SSR Minister of Higher and Secondary Special Education I. Nuut took part in the meeting.

11004

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## CZECH-SOVIET NONFERROUS METALLURGY COOPERATION

Moscow IZVESTIYA in Russian 25 Jan 84 p 5

[Article by L. Kornilov, IZVESTIYA special correspondent, Prague: "Nothing Except...."]

[Text] Academician Kubichek said: "It is our common record achievement. One like it does not exist anywhere in the world. Do you want to become closer acquainted?"

We set off for Panenske-Brzhezany to a scientific research institute for metals -- abbreviated in Czech to VUK--to meet that which "exists nowhere else in the world".

This installation for the production of a wide band of copper alloys, which combines casting with rolling, is the joint child of Soviet and Czechoslovak metallurgical scientists. They began working on it in 1976. One of the assemblies will appear in the northern Czech Kovoguti Povrli enterprise, and another is being installed in the Kolchugin plant for processing nonferrous metals in our Vladimir Oblast. The development of the design and the manufacturing of the pouring part was the work of the VUK workers, and of the rolling mill -- the work of Soviet specialists.

Engineer Zdenek Veselyy, the VUK director told me: "We cooperate closely with the Giprotstvedmet and Giprotsvetmetobrabotka institutes. A clear-cut program exists, duties are strictly distributed, fulfillment periods are strictly monitored, and fines are even provided for their violation. This disciplines. We will enjoy the fruits of our joint work together".

Cooperation with the USSR has been carried out for a long time here, since 1946 when an institute, which rightfully bears the title of an enterprise of Czechoslovak-Soviet friendship, was established in Brno on the base of one of the test laboratories of the Zbroyovka plants.

All told, 313 individuals are working in the VUK. Eleven of them are scientific workers (doctors and candidates of science); the rest are engineers, technicians, laboratory assistants, and workers. Honestly speaking, it seemed to me that this was few especially if you take into account the fact that the VUK is the only institute for nonferrous metals in the Czechoslovak Socialist Republic.

Comrade Veselyy agreed: "Of course, it is too few, but the work is going well. Many highly qualified specialists have been reared in the collective. It is sufficient to mention academician Kubichek who, incidentally, is a graduate of a Soviet VUZ. He has worked in the institute for 28 years. Consider that -- along with research and design work -- our institute has been commissioned to satisfy the needs of the Czechoslovak Socialist Republic for several types of rare metals, for example, super-pure indium.... The cooperation and division of labor with the Soviet Union and with the other socialist countries help us a great deal. The scientific and technical council for the processing of nonferrous metals and secondary metallurgy, which is the working body of the CEMA permanent commission for cooperation in the nonferrous metallurgical area, is located here in Panenske-Brzhezhan. Your humble servant is its director".

The Bratislava PRAVDA newspaper headed an article about the VUK as follows: "Science Without Subsidies". What was its essence? Complete cost accounting has been functioning in the institute for more than a dozen years.

The institute's annual profit approximates five million krona. The national economy receives almost 10 krona in profit from each krona invested in the scientific work of the VUK! Besides state assignments, a great deal of work is carried out in the institute based on contracts. They say here: "We are now in the same boat with the customer". A bonus is a delicate compass for every "seafarer". They do not pay a bonus for overdue, poor quality or late incorporated work.

... Recently, Soviet aviation specialists, who visited the VUK, familiarized themselves with interest with a method of repairing aluminum "fatigue cracks" -- a method which permits the expenditure of metal to be decreased and a longer service life of the fuselage and other parts of the aircraft to be achieved. This work is the latest and it has still not been completely polished. The results, however, are already undoubted-- and on the their basis, the VUK, without any delay, has issued the Czechoslovak aviation industry the first thirty tons of a type with higher strength characteristics. This is a tradition here: If the thing is worth doing, there is nothing to expect from its final formulation on paper. It is necessary to incorporate it more rapidly into life.

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## BULGARIAN-SOVIET SCIENTIFIC COOPERATION DISCUSSED

Tallinn MOLODEZH' ESTONII in Russian 22 Nov 83 p 3

[Interview with Angel Balevskiy, president of the Bulgarian Academy of Sciences: date and place not specified]

[Text] This year, 25 years have passed since the signing of the first agreement on cooperation between the Bulgarian Academy of Sciences and the USSR Academy of Sciences. The interview with Angel Balevskiy, president of the Bulgarian Academy of Sciences, is recommended to our readers' attention.

[Question] Please tell us what role cooperation between the Bulgarian Academy of Sciences and the USSR Academy of Sciences has played in the development of Bulgarian science.

[Answer] When we speak of Bulgarian-Soviet scientific cooperation, one cannot fail to remember that it is essentially a continuation of the traditions of spiritual intercourse between our countries, which has taken shape historically. Science is an area of high spiritual values.

The first steps in forming the Bulgarian Academy of Sciences in its present form were taken a quarter of a century ago. We created new institutes. Naturally they needed personnel. Many of our scientific workers obtained their education and specialization in the Soviet Union. Today, they are the backbone of Bulgarian science.

After our scientific potential grew and became stronger, cooperation was raised to a new level. Now, almost all the institutes of the Bulgarian Academy of Sciences closely cooperate with corresponding institutes of the USSR Academy of Sciences. Basic and applied research on 33 problems and subjects in the area of the social and natural sciences is being carried out through joint efforts. The Bulgarian Academy of Sciences has been transformed into an academy of a new socialist type and is making an important contribution to the development of our country's science and technology and to the common cause of communist construction.



[Question] How do you rate the results of the 25 years of cooperation between Bulgarian and Soviet science?

[Answer] I would single out our joint work to develop a system of equipment for research in the area of the peaceful use of nuclear energy. On the Soviet side, the Nuclear Energy Institute imeni I. V. Kurchatov and, on the Bulgarian side, the Bulgarian Academy of Sciences Central Laboratory for the Automation of Scientific Research and Instrument Construction are participating in it.

For example, effective light conductors and the first results of joint work on the remote sounding of the earth's surface and ocean bottom have been obtained within the framework of implementing the complex special purpose programs. Valuable research on the geological structure of the Black Sea basin and the prospects of its oil and gas bearing structure and also in the area of the genetics and selection of agricultural plants and livestock has been conducted. A method for monitoring the bessemerizing production of steel has been developed on the base of the Kremikov Metallurgical Combine imeni L. I. Brezhnev. Of course the most eloquent illustration of the bilateral scientific cooperation is the space orbiting of the Bulgaria-1300 Interkosmos satellite. Without cooperation with the Soviet country, the People's Republic of Bulgaria would not have been able to take part in space research in such a short period of time and to have obtained results which have received international recognition.

[Question] What are the prospects for the cooperation of Bulgarian and Soviet scientists?

[Answer] At the present time and in accordance with the complex special purpose program out to 1985, both academies are devoting special attention to the accelerated development of instrument making and automation of scientific research. The People's Republic of Bulgaria's Ministry of Machine Building and Electronics is also participating in the implementation of this program. Efforts are primarily being directed toward the development of such equipment as stereo television systems for measuring three-dimensional coordinates and optical instruments (high-speed spectrophotometers with micro-processor controls, laser spectrometers, etc.). It is necessary to develop and construct instruments for geophysical and oceanographic research and equipment for growing single crystals and for microbiological research.

Cooperation with the USSR Academy of Sciences is providing conditions for scientific creativity in the name of peace; and this is making it a factor of importance, which is common to all mankind, and an example of how the science of a small country, which has combined its efforts with the mightiest peace academy -- the USSR Academy of Sciences, can become strong and fruitful and be raised to the level of a valuable scientific partner.